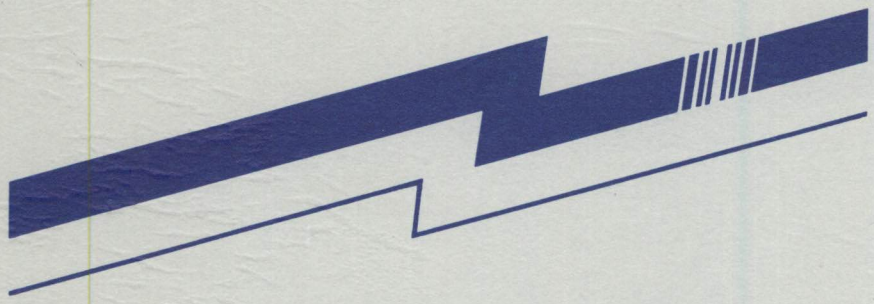


NATIONAL SECURITY TELECOMMUNICATIONS ADVISORY COMMITTEE (NSTAC)

Reports Submitted for NSTAC IX

Volume II

September 22, 1988

Reports Submitted for the Ninth Meeting of the National Security Telecommunications Advisory Committee (NSTAC)

Volume II

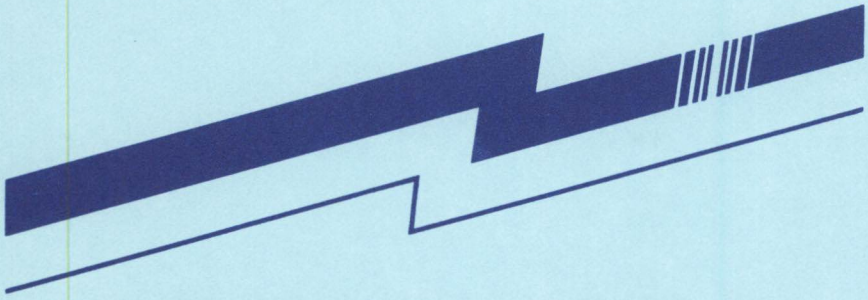
September 22, 1988

- Joint Industry-Government Telecommunications Industry Mobilization (TIM) Group Reports, September 1988

  — Telecommunications Service Surge Requirements Status Report

  — Government and Industry Mobilization Management Structure Final Report

  — Maintenance of Stockpiles and Inventories Final Report



Joint Industry-Government
Telecommunications Industry Mobilization (TIM)
Group Reports

TELECOMMUNICATIONS INDUSTRY MOBILIZATION (TIM)

September 1988

PREFACE

These reports document the work to date of the Joint Industry-Government Telecommunications Industry Mobilization (TIM) Group. It should be noted that, for the purposes of its ongoing study of telecommunications industry mobilization subjects, mobilization is considered by the Joint Group to encompass the interval from peacetime/disaster/crisis through subsequent conventional military actions external to the continental United States. The impact on the telecommunications industry of a nuclear attack on the United States is judged by the Joint TIM Group to involve reconstitution issues, rather than mobilization, and is therefore not addressed.

The Joint TIM Group has thus far addressed five TIM subject areas: Personnel Issues, Telecommunications Service Surge Requirements, Government and Industry Mobilization Management Structure, Dependence on Foreign Sources, and Maintenance of Stockpiles and Inventories. This volume presents the Group's final reports on four of these subjects: Personnel Issues, Dependence on Foreign Sources, Government and Industry Mobilization Management Structure, and Maintenance of Stockpiles and Inventories. The Joint TIM Group is continuing its analysis of Telecommunications Service Surge Requirements; a status report on that subject is also included in this volume.

The Joint Group has developed a framework for the evolutionary completion of a final TIM report. This overall framework is reflected in this volume's Table of Contents, which identifies those sections of the report that are yet to be developed. The "Introduction" and "Background and Approach" sections also reflect the overall scope of the TIM effort. However, to permit separate distribution and use of specific subject area reports, each of those reports will contain an executive summary, a brief description of the background and approach for the ongoing Joint TIM Group study in that subject area, and supporting appendices.

This volume of reports is published in notebook form to facilitate the incorporation of new material and any revisions or updates to the overall report. Any material subsequently provided will be prepared for insertion in the TIM notebook, and the date of initial publication or most recent revision will be indicated.

TABLE OF CONTENTS

*To be completed.

EXECUTIVE SUMMARY

(TO BE COMPLETED)

1.0 INTRODUCTION

Revised
September 1988

The capability to mobilize and use the Nation's telecommunications resources to meet national security needs is a vital national concern. In the United States, telecommunications are supplied predominantly through the private sector. The telecommunications industry thus plays a critical role in ensuring the Nation's ability to effectively mobilize its resources.

Executive Order 12472, "Assignment of National Security and Emergency Preparedness Telecommunications Functions," assigns to the National Security Council (NSC) responsibility for advising and assisting the President "in coordinating the development of policy, plans, programs and standards for the mobilization and use of the Nation's commercial, government, and privately owned telecommunications resources in order to meet national security or emergency preparedness requirements." The National Communications System (NCS) is to assist the President and the National Security Council in the performance of these responsibilities.

The Joint Industry-Government Telecommunications Industry Mobilization (TIM) Group was established by the President's National Security Telecommunications Advisory Committee (NSTAC) and the NCS Committee of Principals (COP) to assist the NCS and NSC in identifying possible impediments to effective telecommunications industry mobilization and mobilization planning and developing corrective actions to overcome any identified impediments.

The Joint TIM Group was charged by the NSTAC and the NCS COP to address seven mobilization subjects:

(1) Personnel Status, Protection, and Relocation,

(2) Government and Industry Mobilization Management Structure,

(3) Telecommunications Service Surge Requirements,

(4) Dependence on Foreign Sources,

(5) Dependence on Other Infrastructure Systems, e.g., Transportation and Electric Power,

(6) Maintenance of Stockpiles and Inventories, and

(7) Jurisdictional Issues (Federal, State, and Local).

The Joint TIM Group was directed to report on these subjects to the NSTAC through its Industry Executive Subcommittee (IES) and to the NCS COP through its Council of Representatives (COR).

Achievement of this goal will require extensive effort by the Joint Group over a considerable length of time. When completed, this report will document the findings, conclusions, and recommendations of the Joint TIM Group in the seven mobilization subjects specified. It will also describe the TIM exercise activities undertaken by the Joint Group and document the results of those activities. An evolutionary framework for completing this report was therefore created. This will permit the Joint TIM Group to report its findings, conclusions, and recommendations to the NSTAC and the NCS COP as specific subject areas are completed. A schedule of milestones for the completion of the TIM study is presented in Figure 1-1.

Within this evolutionary framework, the overall background for the report and the overall approach used by the Group in developing its findings, conclusions, and recommendations are described in Section 2.0. The seven mobilization subjects will be addressed in Sections 3.0 through 9.0. TIM exercise activities and results will be described in Section 10.0. The overall conclusions and recommendations of the Joint TIM Group will be presented in Sections 11.0 and 12.0 respectively. An overall Executive Summary will be developed for the Final Report.

TELECOMMUNICATIONS INDUSTRY MOBILIZATION (TIM)

Overall Schedule

I. Mobilization Subjects
   - (1) Personnel Issues
   - (2) Service Surge Requirements
   - (3) Mobilization Management Structure
   - (4) Dependence On Foreign Sources
   - (5) Infrastructure Systems
   - (6) Stockpiles/Inventories
   - (7) Jurisdictional Issues

II. Exercise Activities

III. Final Report

Key:

- ◊ Study Initiated
- △ Study Completed
- □ Status Report
- ○ Exercise

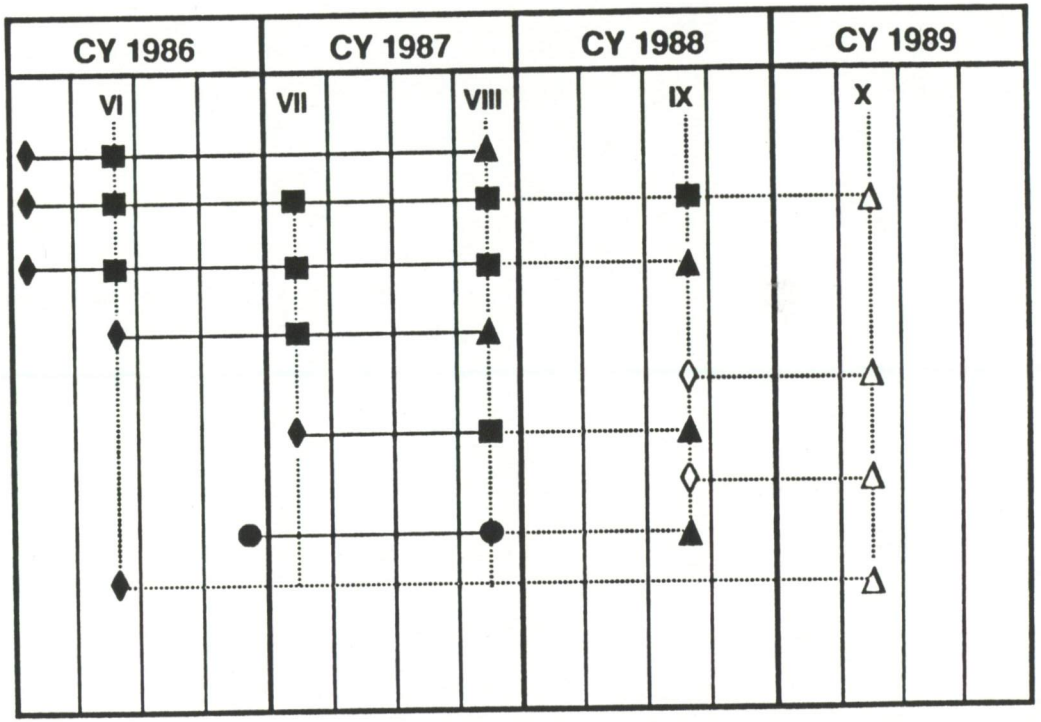


FIGURE 1-1
OVERALL SCHEDULE

2.0 BACKGROUND AND APPROACH

Revised
September 1988

TABLE OF CONTENTS

LIST OF FIGURES

The joint industry-government telecommunications industry mobilization (TIM) study is part of the ongoing joint NSEP telecommunications planning effort carried out by the NCS and the NSTAC. The NSTAC is composed of senior officials of leading telecommunications companies and was established to provide information, advice, and assistance to the President for national security emergency preparedness (NSEP) telecommunications. Since its creation by Executive Order 12382 in 1982, the NSTAC has addressed a series of important NSEP telecommunications issues including telecommunications industry mobilization. The NCS COP is a Government body composed of representatives of the 22 NCS member organizations. It serves as the principal government forum for the review and consideration of NSEP telecommunications matters.

In creating the Joint TIM Group, the NSTAC and the NCS COP acted upon recommendations developed by the NSTAC Telecommunications Industry Mobilization (TIM) Task Force. The Joint Group subsequently used the work of the original NSTAC TIM Task Force as the starting point for its more detailed analyses of the mobilization subjects identified by the Task Force as warranting further study.

2.1 Background

In December 1984, the NCS asked the NSTAC to assist the Government in assessing telecommunications industry mobilization and mobilization planning capabilities. The NCS request to the NSTAC reflected the provisions of the TIM Implementation Measure (Implementation Measure 9) contained in the NCS NSEP Telecommunications Plan of Action (NTPA). The TIM Measure calls for "Federal government leadership for and assistance to telecommunications mobilization planning activities."[1] The first milestone in the Measure was to obtain the views and recommendations of the NSTAC regarding telecommunications industry mobilization and mobilization planning capabilities.

In response to the Government's request, the NSTAC charged its Industry Executive Subcommittee (IES) to assist the Government in bringing the issue into sharper focus and to develop recommendations regarding a future role for NSTAC in the area of telecommunications industry mobilization. The IES, in turn, established a TIM Task Force and instructed it to develop an issue statement that:

- Provided a definition of mobilization for NSTAC purposes,
- Established the scope of the TIM issue,

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[1] Implementation Measure 9, "Telecommunications Industry Mobilization," of the National Security Emergency Preparedness (NSEP) Telecommunications Plan of Action is Appendix 2-A.

- o Identified and discussed the mobilization subjects that could be most fruitfully addressed by the NSTAC, and

- o Offered specific recommendations for further NSTAC actions.

The TIM Task Force defined and clarified the telecommunications industry mobilization issue, identifying seven areas for further study by industry and government:

(1) Telecommunications Service Surge Requirements,

(2) Personnel Status, Protection, and Relocation,

(3) Maintenance of Stockpiles and Inventories,

(4) Dependence on Foreign Sources,

(5) Dependence on Other Infrastructure Systems, e.g., Transportation and Electric Power,

(6) Government and Industry Mobilization Management Structure, and

(7) Jurisdictional Issues (Federal, State, and Local).

The findings of the TIM Task Force were documented in a two-volume report[2] and presented for review and approval at the October 9, 1985 meeting of the NSTAC. The NSTAC subsequently charged its IES to assist the NCS in addressing the seven mobilization subjects identified.

In response to the NSTAC's findings and recommendations, a Joint Industry-Government TIM Group was established by the NSTAC and the NCS COP. The Joint TIM Group is composed of five industry members representing interexchange carriers, local exchange carriers, and manufacturers, and five Government members representing those NCS member organizations with key mobilization roles.[3] The Joint TIM Group is chaired by the Assistant Manager for the Joint Secretariat of the Office of the Manager, NCS (OMNCS). An industry representative serves as the vice chair of the Joint TIM Group.

In establishing the Joint TIM Group, the NSTAC and the NCS COP agreed that the Group would initially address three of the seven mobilization subjects identified by the NSTAC TIM Task Force: Personnel Status,

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[2]Final Report of the Telecommunications Industry Mobilization (TIM) Task Force, Volume I, "TIM Issue Statement," and Volume II, "Background and Supporting Materials," September 5, 1985.

[3]The membership of the Joint TIM Group is identified in Appendix 2-B.

Protection, and Relocation; Telecommunications Service Surge Requirements; and Government and Industry Mobilization Management Structure. The Joint TIM Group was to report to the NSTAC and the NCS COP on a continuing basis, presenting its findings, conclusions, and recommendations as they became available. As the initial studies were completed, the Joint TIM Group would then take up the remaining mobilization subjects on a sequential basis until all had been addressed.[4]

2.2 Approach

The Joint TIM Group is using the work of the original NSTAC TIM Task Force as the starting point for more detailed analyses of the seven mobilization subjects. However, a set of objectives for the overall TIM study was also defined to guide the Group's efforts. The overall objectives reflect the provisions of the TIM Implementation Measure in the NCS NSEP Telecommunications Plan of Action (NTPA), calling for:

- The identification of possible impediments to effective telecommunications industry mobilization and mobilization planning and the recommendation of corrective actions
- The identification and recommendation of any Federal government actions needed to support telecommunications industry mobilization planning activities[5]

In addition, the Joint TIM Group defines a series of near term objectives to guide its efforts in specific subject areas. For example, the near term objective established for the personnel area was to present a substantive report on Personnel Issues at the sixth meeting of the NSTAC in May 1986 and at the July 1986 meeting of the NCS COP. Similar objectives are established in other subject areas as the Joint TIM Group effort proceeds.

As the first step in addressing a specific subject area, the Joint TIM Group reviews the findings of the original NSTAC TIM Task Force in that subject area. These findings are in the form of questions or issues to be addressed and are included in each of the Joint TIM Group's subject area reports. As part of its review and assessment of the original NSTAC TIM Task Force's findings, the Joint TIM Group identifies the information needed to supplement the experience and current knowledge of its members and arranges for briefings and written materials to be provided by relevant Federal Government and private sector organizations. Industry

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[4]The NSTAC charge to the IES and the TIM approach approved by the IES and the NCS COP are provided in Appendix 2-C.

members also obtain data from their companies. This information is discussed and assessed in Group meetings. In addition, the Group visits industry and Government facilities to gain first-hand information and insights into specific procedures and capabilities relating to mobilization.

As information is acquired and reviewed by the Group, each area of concern is assessed in terms of:

(1) Is there a requirement? If so, what is its nature or extent?

(2) What is the capability of industry to respond? Is this adequate? If not, how can it be improved?

(3) Are there any impediments to improving the capability? If so, how can these impediments be overcome or removed?

The Joint TIM Group works within the context of the mobilization definition developed by the original NSTAC TIM Task Force:

> The process of marshalling those telecommunications resources needed to make the transition from a normal state to a state of readiness for war or other national emergency.[6]

However, the Joint TIM Group has further agreed that, for purposes of its studies, mobilization is considered to encompass the interval from peacetime/disaster/crisis through subsequent conventional military actions external to the continental United States, as illustrated in Figure 2-1. The impact on the telecommunications industry of a nuclear attack upon the United States is judged by the Joint TIM Group to involve reconstitution, as opposed to mobilization, issues and is therefore not addressed.

The following set of four mobilization time periods is being used by the Joint TIM Group as a further aid in sorting, organizing, and assessing mobilization capabilities:

(1) Pre-Mobilization: Planning and Pre-Positioning

(2) Short-Term: 0 to 90 days (Reallocation and Reprioritization of Existing Capability and Service)

(3) Mid-Term: 90 to 180 days (Reallocation and Reprioritization of Products and Services in the Pipeline)

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[6] Final Report of the Telecommunications Industry Mobilization (TIM) Task Force: Volume I, "TIM Issue Statement," p.5.

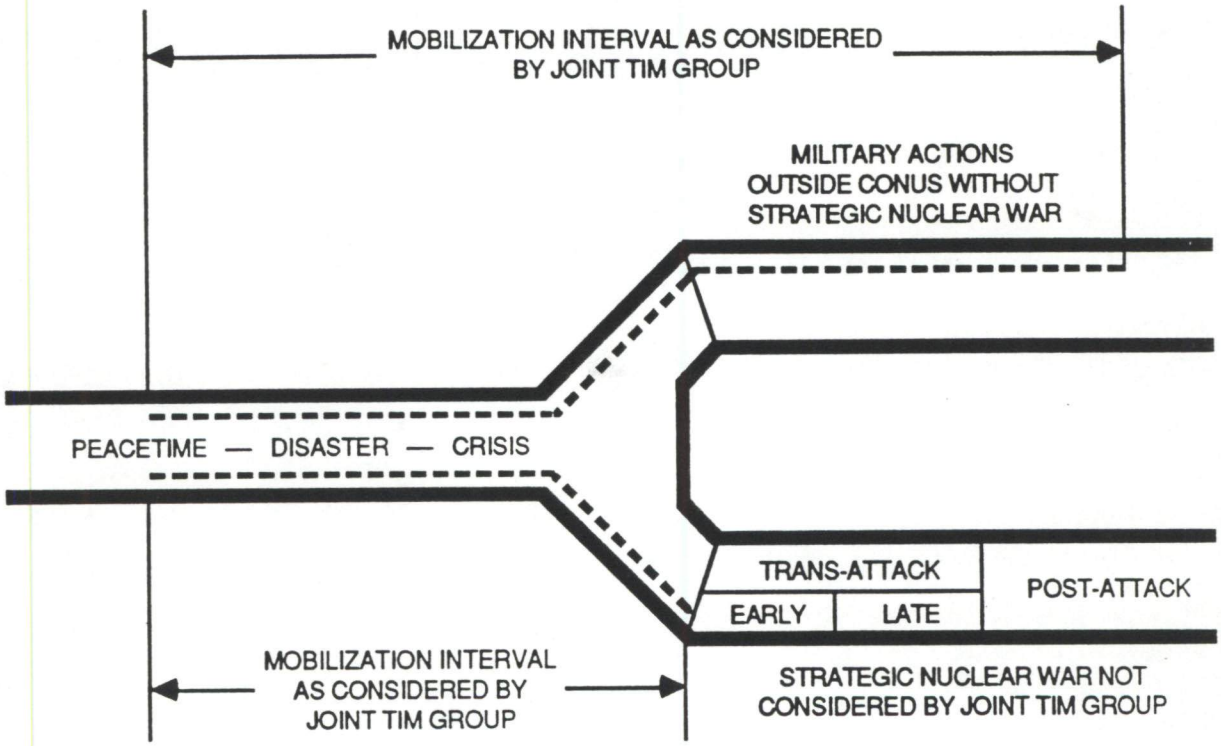

FIGURE 2-1
MOBILIZATION INTERVAL

(4) Long-Term: Over 180 days (Expanded Production of Capacity and Services.)

As a final step, the Joint Group summarizes its findings in each area, stating conclusions, identifying any follow-on or remedial actions that might be needed, and developing specific recommendations for accomplishing such actions. These findings, conclusions, and recommendations are then documented in the subject area sections of this report.

Following the completion of the seven subject area studies, overall conclusions and recommendations will be developed by the Joint TIM Group on the basis of its analyses and the results of TIM exercise activities, and incorporated in a final TIM report.

APPENDIX 2-A

IMPLEMENTATION MEASURE 9
"TELECOMMUNICATIONS INDUSTRY MOBILIZATION"
NSEP TELECOMMUNICATIONS PLAN OF ACTION

TELECOMMUNICATIONS INDUSTRY MOBILIZATION

I. PREPAREDNESS AREA: National Security Emergency Preparedness (NSEP) Telecommunications

II. IMPLEMENTATION MEASURE: Provide Federal government leadership for and assistance to telecommunications industry mobilization planning activities.

III. STATUS: Included in current programs

IV. EXPECTED BENEFIT: The Nation's dependence upon commercially provided telecommunications systems makes it essential that adequate provisions are made for the effective mobilization of the productive resources of the commercial telecommunications industry, including its capability to meet surge demands and to supply adequate human resources to support mobilization. This measure provides for Federal government action to encourage, support, and enhance telecommunications industry mobilization planning activities. These actions would be undertaken in coordination with the Industrial Mobilization Working Group (IMWG) of the Emergency Mobilization Preparedness Board (EMPB) and the Federal Emergency Management Agency (FEMA). Accomplishment of this measure will assist the EOP in executing the responsibilities assigned by Section 2(c)(1)a of Executive Order 12472.

V.

IMPLEMENTING MILESTONES	Deliverable	Organization	Date
a. Obtain the views and recommendations of the National Security Telecommunications Advisory Committee (NSTAC) with respect to telecommunications industry mobilization and mobilization planning capabilities, providing any necessary technical assistance for NSTAC study and deliberations	NSTAC Report	OMNCS	3 FY 86
b. Identify possible impediments to effective telecommunications industry mobilization and mobilization planning (e.g., regulatory and legal constraints) and recommend corrective actions.	Report/ Recommendations	OMNCS/COP	4 FY 86
c. Identify and recommend, in consultation with the EMPB IMWG, any Federal government actions needed to support telecommunications industry mobilization planning activities	Draft Recommendations	OMNCS/COP	1 FY 87
d. Forward to EOP for review and assignment of responsibilities for action	Transmittal of COP Recommendations	OMNCS	2 FY 87

APPENDIX 2-B

MEMBERSHIP OF JOINT TIM GROUP

Revised
August 1988

JOINT INDUSTRY-GOVERNMENT
TELECOMMUNICATIONS INDUSTRY MOBILIZATION (TIM) GROUP

Industry Members

ATT	Mr. John P. Miller
BELLCORE	Mr. W. Gordon Ramsey
MARTIN MARIETTA	Mr. John R. Hocker
NORTHERN TELECOM	Dr. John S. Edwards
ROCKWELL	Mr. James T. Carter

Government Members

DOD	Mr. Donald Kraft
DOJ	Mr. Luin Fitch
FEMA	Mr. Steven F. Hood
GSA	Mr. J. B. Brilliant
NTIA	Mr. Arthur J. Altenburg

Chair

OMNCS	CAPT Terrence N. Danner, USN

Vice-Chair

NORTHERN TELECOM	Dr. John S. Edwards

Other Participating Organizations

MCI
ITT
CONTEL ASC
GTE
DOS

APPENDIX 2-C

NSTAC CHARGE TO IES AND PROPOSED TIM APPROACH

TELECOMMUNICATIONS INDUSTRY MOBILIZATION (TIM)

NSTAC CHARGE TO IES

- ASSIST THE NCS IN FURTHER STUDYING AND RECOMMENDING ACTIONS REGARDING:
  - — TELECOMMUNICATIONS SERVICE SURGE REQUIREMENTS
  - — PERSONNEL STATUS, PROTECTION, AND RELOCATION
  - — MAINTENANCE OF STOCKPILES AND INVENTORIES
  - — DEPENDENCE ON FOREIGN SOURCES
  - — DEPENDENCE ON OTHER INFRASTRUCTURE SYSTEMS
  - — GOVERNMENT AND INDUSTRY MOBILIZATION MANAGEMENT STRUCTURE
  - — JURISDICTIONAL ISSUES (FEDERAL, STATE, LOCAL)
- PROVIDE STATUS REPORT AT NEXT NSTAC MEETING

PROPOSED APPROACH

- ADDRESS TWO OR THREE SUBJECTS INITIALLY
  - ONE SUBJECT OF PARTICULAR SIGNIFICANCE TO INDUSTRY (PERSONNEL STATUS, PROTECTION, AND RELOCATION)
  - BEGIN IDENTIFICATION OF TELECOMMUNICATIONS SERVICE SURGE REQUIREMENTS
  - ONE SUBJECT OF PARTICULAR SIGNIFICANCE TO BOTH GOVERNMENT AND INDUSTRY (GOVERNMENT AND INDUSTRY MOBILIZATION MANAGEMENT STRUCTURE)
- SEEK INDUSTRY (IES) - GOVERNMENT (COR/COP) AGREEMENT

PROPOSED APPROACH (CONCLUDED)

- ESTABLISH INDUSTRY/GOVERNMENT TIM GROUP
  - Industry members via NSTAC
    - Manufacturers (3)
      Martin Marietta, Rockwell, & Northern Telecom
    - Interexchange Carrier (1)
      AT&T
    - Local Exchange Carrier (1)
      Bellcore
  - Government members via NCS COR/COP
    - DOD/OJCS (1)
    - DOC/NTIA (1)
    - FEMA (1)
    - FCC/DOJ (1)
    - GSA (1)
  - Chair: OMNCS

3.0 PERSONNEL ISSUES
(FINAL REPORT)

September 1987

ADDENDUM

On October 6, 1987, the Industry Executive Subcommittee (IES) of the National Security Telecommunications Advisory Committee (NSTAC) approved the recommendations made in this report, subject to a revision of the wording of the first recommendation. The IES-approved recommendation is as follows:

(1) The NCS, in conjunction with the telecommunications industry, should continue to monitor the potential effects of mobilization on telecommunications industry personnel. Experience gained from military and civil preparedness exercises and real world contingencies should be used for this purpose.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

The telecommunications industry plays a critical role in assuring the Nation's ability to effectively mobilize its resources. The impact of mobilization on telecommunications industry personnel is thus a key area of concern in evaluating the overall ability of the industry to maintain its existing service and production capabilities and to accommodate increased service and equipment demands under mobilization conditions.

The Joint Industry-Government Telecommunications Industry Mobilization (TIM) Group was established by the President's National Security Telecommunications Advisory Committee (NSTAC) and the National Communications System (NCS) Committee of Principals (COP) to assist the NCS in the performance of mobilization responsibilities assigned in Executive Order 12472. This report documents the final findings, conclusions, and recommendations of the Joint TIM Group regarding personnel issues.

Using the work of the NSTAC TIM Task Force as the starting point for more detailed analysis of telecommunications industry mobilization personnel issues, the Joint TIM Group reviewed and analyzed the following personnel issues: (1) Draft, Reserve, and National Guard Obligations, (2) Employee Status Tracking, (3) Physical Protection/Support, (4) Relocation/ Movement of Personnel, (5) Training/Skill Levels, (6) Work Force Expansion, and (7) Providing For Key Personnel and Their Families.

Conclusions

The Joint TIM Group has concluded that a military mobilization call-up would not significantly affect the telecommunications work force in the Short- and Mid-Term from either a qualitative or quantitative perspective. Only about 2% of the industry's work force would be affected during this period. In the Long-Term, the Group concluded that a higher percentage of telecommunications industry personnel could be affected, perhaps as high as 4-8%. However, the Joint Group concluded that the industry would have time during the Short- and Mid-Term to plan for these potentially greater losses.

Although the Joint Group determined that a system for tracking the military obligations of employees could be useful, it concluded that, given the estimated small number of employees initially affected, telecommunications companies would probably not establish or maintain such systems unless directed to do so by the Federal government. The Group anticipates that the estimate of affected employees will continue to be assessed during future NCS and joint industry-government military and civil preparedness exercises.

The need for special measures for the physical protection or support of industry personnel under conditions other than nuclear attack is not anticipated and is not being planned for by the telecommunications industry. The Joint Group agreed that there is little or no risk of attacks on the vast majority of industry personnel in crisis or other emergencies short of a nuclear attack on the United States. Taking this information into consideration, the Joint TIM Group determined that there is no need for extraordinary measures to ensure the physical security and protection of industry personnel under the conditions addressed in this report.

On the basis of its initial work, the Joint TIM Group found that there could be impediments to the transportation of installers or maintenance personnel to and from field sites under emergency conditions. The Group concluded that requirements for the priority movement of telecommunications personnel should be identified and incorporated in DOT emergency plans. Such efforts are being carried out by the Department of Transportation (DOT) and the Office of the Manager NCS, (OMNCS). The Group also concluded that, as part of its later study of Jurisdictional Issues, it should review, with the Federal Emergency Management Agency (FEMA), State and local provisions for the priority movement of telecommunications industry personnel and materials during mobilization.

The Joint Group concluded that, in the Short- or Mid-Term mobilization time periods, there is no urgent need for new or additional training programs. For Long-Term mobilization, the Group concluded that any increased numbers of skilled personnel needed by the industry could be supplied by existing training facilities and programs, with principal reliance on technical schools and in-company training.

The Joint TIM Group also agreed that, for a period of six months, the telecommunications industry could maintain, or even increase, present levels of service or production with work forces at their current, or slightly reduced, levels. Major work force expansion would thus not be required in the Short- or Mid-Term. However, the Group also agreed that if mobilization lasted for a longer period during which demand for service continued to increase, an expansion of existing work forces might be required.

The Joint TIM Group determined that there is no need for extraordinary measures to ensure the physical security and protection of key personnel and their families under the conditions addressed in this report.

Recommendations

Based on the information and conclusions developed during the Joint Group's study of personnel issues, the Group recommends the following:

(1) The NCS and the telecommunications industry should periodically assess the potential effects of mobilization on telecommunications industry personnel, using both military and civil preparedness exercises and real world contingencies for this purpose.

(2) If, as a result of continuing personnel impact assessment, changes are discovered in the composition of company and/or industry work forces and skill mixes, or increases are found in the estimated percentages of industry personnel affected by draft/Reserve/National Guard obligations, then individual companies should consider:

- Tracking the military obligations of their employees (i.e., potential draftees and Reservists)

- Identifying to the NCS occupational skills that they consider critical in order to seek reinstatement of occupational draft deferments

- Requesting the transfer or discharge of identified key personnel from the Ready Reserve

3.1 Introduction

The Joint Industry-Government Telecommunications Industry Mobilization (TIM) Group was established by the President's National Security Telecommunications Advisory Committee (NSTAC) and the National Communications System (NCS) Committee of Principals (COP) to: (1) identify possible impediments to effective telecommunications industry mobilization and mobilization planning and (2) assist in the development of corrective actions to overcome any identified impediments. The impact of mobilization on telecommunications industry personnel is a key area of concern in evaluating the overall ability of the industry to maintain its existing service and production capabilities and to accommodate increased service and equipment demands under mobilization conditions. This report documents the Joint TIM Group's final findings, conclusions, and recommendations regarding personnel issues. The NCS and the telecommunications industry will, however, continue to assess the impacts of mobilization on telecommunications industry personnel through participation in exercises.

3.2 Background/Approach

In December 1984, the NCS asked the NSTAC to assist the Government in assessing telecommunications industry mobilization and mobilization planning capabilities. In response to the Government's request, the NSTAC charged its Industry Executive Subcommittee (IES) to assist the Government in bringing the issue into sharper focus and to develop recommendations regarding a future role for NSTAC in the area of telecommunications industry mobilization. The IES, in turn, established a TIM Task Force and instructed it to develop a TIM issue statement.

The TIM Task Force defined and clarified the telecommunications industry mobilization issue, identifying seven areas for further study by industry and Government, including Personnel Status, Protection, and Relocation. The personnel findings of the TIM Task Force were included in a two-volume report[1] and presented for review and approval at the October 9, 1985 meeting of the NSTAC. The NSTAC subsequently charged its IES to assist the NCS in addressing the seven mobilization subjects identified, including personnel issues.

In establishing the Joint TIM Group, the NSTAC and the NCS COP agreed that the Group would initially address three of the seven mobilization subjects identified by the NSTAC TIM Task Force: Personnel Status, Protection, and Relocation; Telecommunications Service Surge Requirements; and Government and Industry Mobilization Management Structure. The Group was to work first toward the development of a substantive report on Personnel Issues for presentation to the NSTAC and the COP.

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[1] Final Report of the Telecommunications Industry Mobilization (TIM) Task Force, Volume I, "TIM Issue Statement," and Volume II, "Background and Supporting Material," September 5, 1985.

The Joint TIM Group used the work of the original NSTAC TIM Task Force as the starting point for more detailed analysis of telecommunications industry mobilization personnel issues. The Group's overall objectives in the personnel area reflect the provisions of the TIM Implementation Measure in the NCS National Security Emergency Preparedness (NSEP) Telecommunications Plan of Action (NTPA), calling for:

- The identification of possible impediments to effective telecommunications industry mobilization and mobilization planning and the recommendation of corrective actions

- The identification and recommendation of any Federal Government actions needed to support telecommunications industry mobilization planning activities.

As a first step toward the accomplishment of these objectives, the Joint TIM Group reviewed the personnel findings of the original NSTAC TIM Task Force, as documented in its September 1985 report. These findings were in the form of questions or issues to be addressed and are provided as Appendix 3-A. The Joint TIM Group then sought detailed information from relevant Federal government agencies, including the Department of Defense (DOD), the Selective Service System (SSS), the Department of Transportation (DOT), and the Federal Emergency Management Agency (FEMA). Industry members also obtained data from their companies. In addition, a visit was made to an industry facility where special procedures had been developed and implemented to handle rapid expansion, which required the introduction of new, untrained employees.

The Joint TIM Group worked within the context of the following definition of mobilization developed by the original NSTAC TIM Task Force:

> The process of marshalling those telecommunications resources needed to make the transition from a normal state to a state of readiness for war or other national emergency.[2]

Mobilization was considered to encompass peacetime/disaster/crisis through subsequent conventional military actions external to the continental United States as shown in Figure 3-1. The impact of a nuclear attack on telecommunications industry personnel was judged by the Joint TIM Group to be outside the scope of its study. Four mobilization time periods were also used by the Joint TIM Group in analyzing personnel issues:

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[2] Final Report of the Telecommunications Industry Mobilization (TIM) Task Force, Volume I, "TIM Issue Statement", p.5.

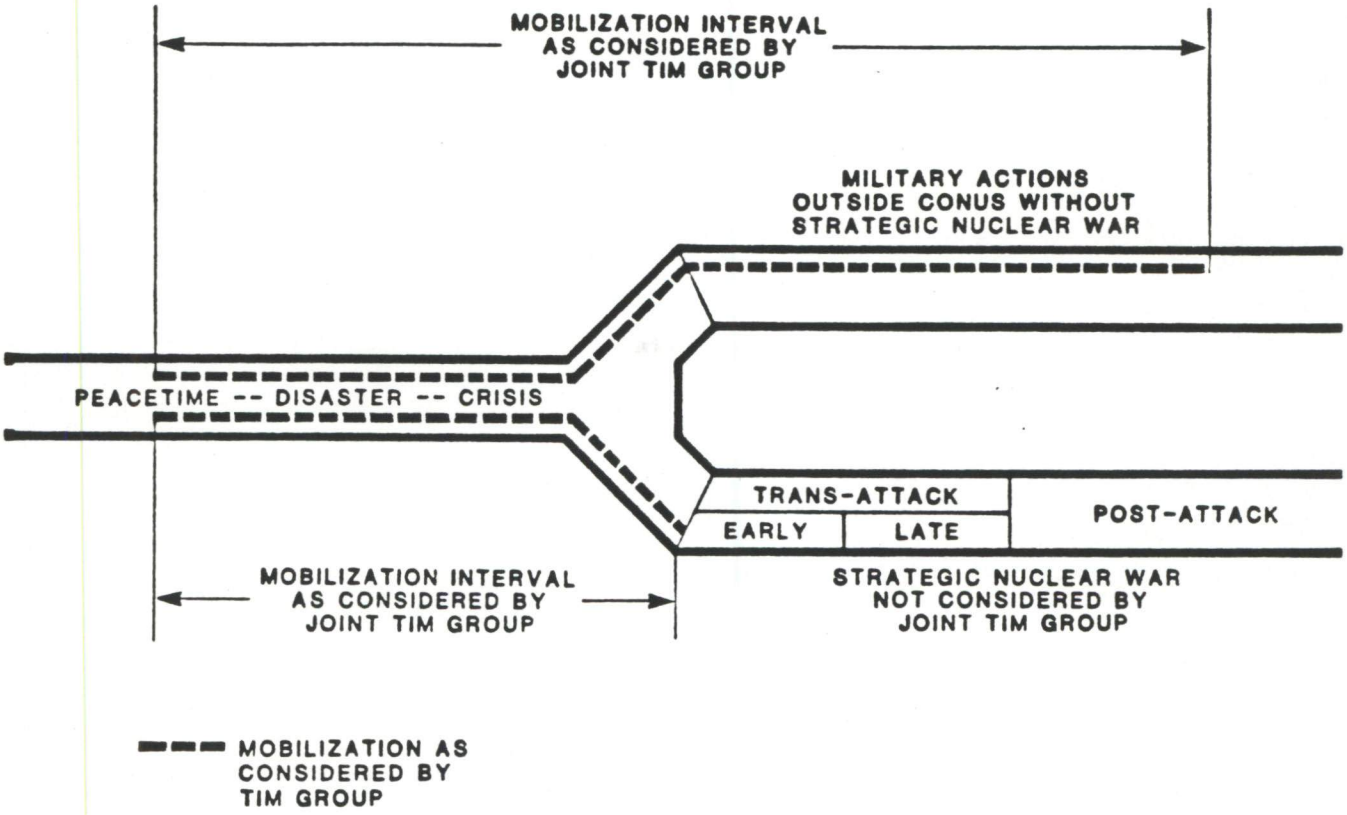

FIGURE 3-1

MOBILIZATION INTERVAL

(1) Pre-Mobilization: Planning and Pre-Positioning

(2) Short-Term: 0 to 90 days (Reallocation and Reprioritization of Existing Capability and Service)

(3) Mid-Term: 90 to 180 days (Reallocation and Reprioritization of Products and Services in the Pipeline)

(4) Long-Term: Over 180 days (Expanded Production of Capacity and Services)

The original NSTAC TIM Task Force summarized its concerns in the personnel area as follows:

> The maintenance of key personnel in critical positions is a significant telecommunications industry mobilization concern. However, firms typically do not ask for information on employees' reserve/draft status because of possible legal ramifications (e.g., discrimination suits). Government and industry action is needed to define an acceptable method for acquiring and maintaining the information needed to determine employee status. Means for protecting key telecommunications industry personnel from competing demands for technically-trained personnel, including military demands, also need to be addressed by both government and industry.
>
> It may also be necessary for companies to move or relocate essential employees as part of a mobilization effort. The practical aspects of personnel movement (e.g., availability of vehicles and fuel or ability to pass roadblocks) also need further study.[3]

The following specific issues were raised by the original NSTAC TIM Task Force:

(1) Draft, Reserve, and National Guard Obligations

(2) Employee Status Tracking

(3) Physical Protection/Support

(4) Relocation/Movement of Personnel

(5) Training/Skill Levels

(6) Work Force Expansion

(7) Providing For Key Personnel and Their Families

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[3] Final Report of TIM Task Force, Volume I, p.9.

The Joint Group decided that these seven issues encompass adequately the personnel aspects of mobilization from the perspective of the telecommunications industry.

The preliminary findings, conclusions, and recommendations of the Joint TIM Group were presented in its May 22, 1986 report to the NSTAC and the NCS COP. In response to questions raised by the NSTAC and the NCS COP, the Joint TIM Group subsequently gathered and analyzed additional data on the draft and Reserve/National Guard obligations of telecommunications industry personnel. Two data sources were used: (1) a survey conducted in a small number of industry facilities and (2) detailed data on 1986 telecommunications employment demographics obtained from the Department of Labor's Bureau of Labor Statistics (BLS). The results of this follow-on data collection and analysis effort are described in section 3.3.1 below.

3.3 Findings

To maintain continuity with earlier efforts, the personnel-related findings of the Joint Group are presented below in terms of the seven issues originally identified by the NSTAC TIM Task Force.

3.3.1 Draft, Reserve, and National Guard Obligations

Despite the high level of automation of both carriers and manufacturers, the original NSTAC TIM Task Force was concerned that the ability of the telecommunications industry to meet critical demands under conditions of mobilization might be adversely affected by the loss of key personnel. A military mobilization call-up could entail activation of reserve components[4] as well as the draft of males from the ages of 18 through 25 by means of the Selective Service System (SSS). Sudden withdrawal of trained employees would be likely to occur at times of surge demand for telecommunications service.

The following employee categories were initially identified by the Joint TIM Group as being of particular concern:

- Trained technicians in the prime draft age range (18-25)[5]
- Technical specialists who are currently members of reserve components
- Others occupying key managerial or operational positions who are members of reserve components

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[4]Reserve components include: the Army National Guard, the Army Reserve, the Naval Reserve, the Marine Corps Reserve, the Air National Guard, the Air Force Reserve, and the Coast Guard Reserve. Categories of reservists subject to call-up are identified in Appendix 3-B.

[5]According to the Selective Service System, registrants aged 26 and over are no longer maintained on active file.

Also, telecommunications industry personnel who are retired from the military services are subject to recall. The Joint TIM Group considered the potential effect of a military retirees recall on the telecommunications industry as a whole. It also considered potential effects on particular geographic areas where there may be significant concentrations of military retirees. In these areas, those service providers affected would move personnel from less affected areas to meet operational requirements. The Joint Group decided that the loss of personnel through a recall of military retirees was not a major concern.

The principal focus of the Joint Group's investigation of draft, Reserve, and National guard obligations was assessment of the overall quantitative and qualitative effects of a loss of industry personnel on telecommunications industry operations, and the identification of approaches for minimizing losses.

Quantitative Effects

The overall number of telecommunications personnel who might be affected by a military call-up was investigated by the Group in two phases. Although telecommunications companies do not keep formal, centralized records of the military status of employees, the industry members of the Joint TIM Group indicated that informal records of status are kept at department and supervisory levels within companies. Therefore, to estimate the likely impact of a military call-up, industry members first obtained informal information from the personnel and operating departments of their companies. On the basis of this information and industry experiences during strikes and other emergencies, the Joint TIM Group initially concluded that the overall impact of a military call-up on telecommunications personnel would be minimal, both for carriers and manufacturers. This conclusion was based on the Group's finding that only a small percentage (approximately 2% in the Short- and Mid-Term) of company employees would be affected, and that vacated positions could be filled by other employees with similar training.

Following the submission of its initial report[6], the Joint Group undertook more detailed investigations of the effects of the two components of a military mobilization: (1) a Reserve/National Guard call-up[7] and (2) a resumption of the draft.

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[6]The Joint Group completed an initial Personnel Issues report in May, 1986. The NSTAC and NCS COP raised questions regarding the Draft, Reserve and National Guard obligations conclusions, prompting the more detailed investigation and subsequent revision of the Personnel Issues report.

[7]Additional data on the civilian occupations of Reserve personnel may also be available in the near future through the Defense Manpower Data Center.

The extent of the Reserve/National Guard obligations of industry personnel was investigated through the analysis of data obtained from a survey distributed to a small number of TIM industry member facilities and from the personnel data bases of two other companies.[8] Since the survey was intended as a trial effort, definitive results were not expected. Nonetheless, some inferences may be drawn from its results. The overall results, as shown in Table 3-1, confirmed that about 1 to 2% of employees (male and female combined) had Reserve/Guard obligations. This compares to a national average of 1.5 % for all industries.[9]

TABLE 3-1
PERCENTAGE OF U.S. TELECOMMUNICATIONS COMPANY EMPLOYEES AT SELECTED FACILITIES WITH RESERVE/NATIONAL GUARD OBLIGATIONS

COMPANY FACILITY	NUMBER OF EMPLOYEES	NUMBER WITH RESERVE/GUARD OBLIGATIONS	PERCENTAGE WITH OBLIGATION
SURVEY RESPONSES			
AT&T	377	2	.5
Bellcore	168	11	6.5
NTI	267	6	2.2
Subtotal	*812*	*19*	*2.3*
DATABASE EXTRACTS			
Martin Marietta	4401	25	.6
Rockwell	86	9	10.5
Subtotal	*4487*	*34*	*.8*
TOTAL	5299	53	1.0

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[8] See Appendix 3-C for a more detailed explanation of the survey methodology and results.

[9] Based on size of Reserve forces as reported by DOD, and size of civilian work force as reported by Bureau of Labor Statistics for calendar year 1986.

The survey results, however, varied considerably across facilities. Some facilities are likely to be quite heavily affected by mobilization (e.g. 10% personnel loss), even though most are not. In addition, the data showed marked demographic differences among facilities, further indicating that mobilization could affect each facility differently. These demographic differences are shown in Figure 3-2, which presents the data by age and sex.

In contrast to Reservists, future draftees cannot be specifically identified. Further, since the Selective Service System (SSS) does not classify registrants as to their suitability for induction[10], it is not possible to ascertain whether individual registrants would actually be lost to industry if the draft were reinstituted. Therefore, a different approach, based on national employment data obtained from the Bureau of Labor Statistics and on data obtained from the SSS, was used to determine the number of telecommunications personnel who might be affected by the draft.

In accordance with current law, a draft call-up would be conducted as a lottery among all registrants (males from the ages of 18 through 25). Because of its random nature, the draft can thus be assumed to affect the same proportion of draft-eligible men employed by the telecommunications industry as it does for the general draft-eligible population. Therefore, an estimate of the number of telecommunications personnel likely to be inducted can be derived from a calculation of the proportion of individuals from the general draft-eligible individuals likely to be inducted, as formulated below.

$$\frac{\text{Total Inducted (US POP.)}}{\text{Total Eligible (US POP.)}} = F = \frac{\text{Total Inducted (TELECOMM POP.)}}{\text{Total Eligible (TELECOMM POP.)}}$$

$$\text{Total Inducted (TELECOMM POP.)} = F \times \text{Total Eligible (TELECOMM POP.)}$$

$$\text{\% Work Force Lost (TELECOMM)} = \frac{\text{Total Inducted (TELECOMM POP.)}}{\text{Total Work Force (TELECOMM POP.)}}$$

The current draft-eligible population is approximately 15,247,000.[11] Current policy on the number of personnel to be inducted is 100,000 within 30 days after mobilization is declared.[12] However, a

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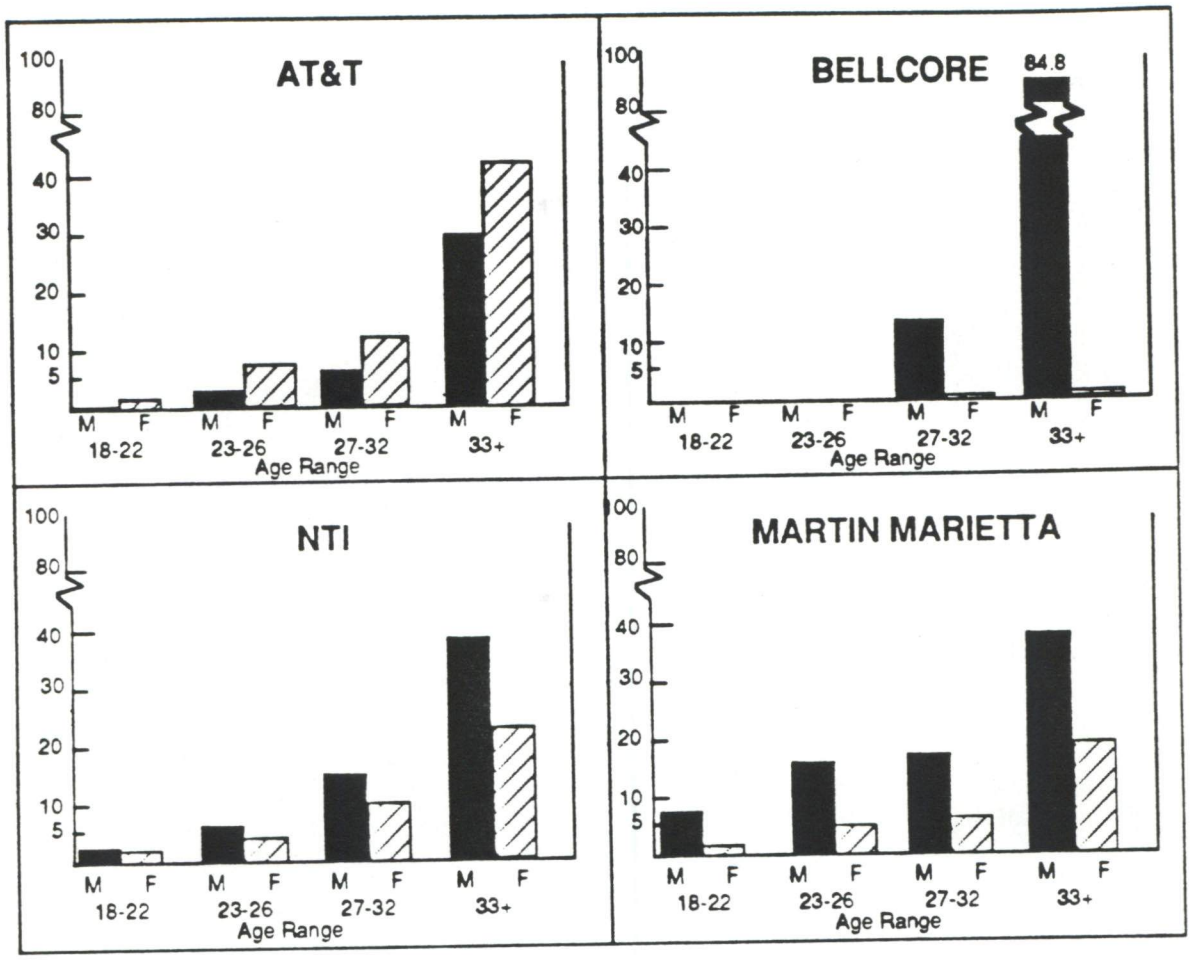
[10]The term "inducted" will be used to indicate actual entry into the Armed Forces; the term "draft-eligible" to mean a male within the 18-25 age range. Draft-eligible registrants may be found unsuitable for induction based on physical or psychological factors, or the granting of draft deferments.

[11]Total number of registrants on file during 1986.

[12]Letter from Assistant Secretary of Defense (MR&L) to Director, SSS dated November 1980.



AT&T, Bellcore, and NTI data based on survey responses.
Martin Marietta (MMIC) data based on database extract.
Rockwell data did not include age/sex information

FIGURE 3-2

EMPLOYMENT BY AGE AND SEX
AT SELECTED FACILITIES

policy that would instead require 300,000 within 90 days is now under consideration by DOD. Using these current and proposed policies as the low and high bounds for the number of inductees required in the Short-Term (0 to 90 days), it can be estimated that .66 to 2.0 per cent of the general draft-eligible population would be inducted. For example, the low percentage is computed as follows:

$$\frac{\text{Total Inducted (US POP.)}}{\text{Total Eligible (US POP.)}} = F = \frac{100{,}000}{15{,}247{,}000} = .0066 = .66\%$$

Applying this same proportion (.66 %) to the number of draft-eligible personnel in the telecommunications industry (114,000), the results are as follows:[13]

$$\text{Total Inducted (TELECOMM POP.)} = .0066 \times 114{,}000 = 750$$

$$\%\ \text{Work Force Lost (TELECOMM)} = \frac{750}{1{,}849{,}000} \times 100 = .04\%$$

The estimated percentage of the overall industry work force likely to be inducted in the Short-Term is very small, i.e., 750 to 2,250 employees. This small number is due both to the small draft requirement in the Short-Term and the small number of draft-eligible telecommunications employees. This number represents .04-.12 percent of the telecommunications work force (see Table 3-2). Table 3-2 also provides more detailed data on the number of draft-eligible individuals in the telecommunications industry, the number likely to be inducted, and the percent of work force likely to be inducted for the service and manufacturing sectors, respectively, in the Short-Term (0 to 90 days).

The number of inductees required in the Long-Term is dependent on the scenario assumed, and there is no current policy on which to base an estimate. Lacking a definitive Long-Term requirement, two historical data points--World War II and the Vietnam War--were used to explore potential Long-Term effects on the telecommunications industry work force.

During World War II, U.S. forces grew to over 12 million. During the Vietnam War, about 1,100,000 individuals were in service at any one time as a result of the draft. To illustrate the potential effect of a draft larger than that anticipated in the Short-Term upon telecommunications industry personnel, the ratio of the percentage of work force lost for every 100,000 total inductees can simply be extrapolated. However, extending the extrapolation to World War II draft levels introduces a problem: the demand for inductees exceeds the supply available under current policy (see Figure 3-3).

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[13]See Appendix 3-D for the details of the application of this methodology.

TABLE 3-2
EFFECT OF THE DRAFT ON THE U.S. TELECOMMUNICATIONS INDUSTRY WORKFORCE IN THE SHORT-TERM
(NUMBERS IN THOUSANDS)

	WORK FORCE	DRAFT ELIGIBLE	NUMBER INDUCTED	PERCENT OF WORK FORCE INDUCTED
UNITED STATES				
Total Civilian	108,055+	15,247*	100 - 300	.09 - .28
TELECOMMUNICATIONS**				
Service	1,322	71	.5 - 1.4	.04 - .11
Manufacturing	517	43	.3 - .85	.06 - .16
TOTAL TELECOMM	1,849	114	.75 - 2.25	.04 - .12

+Source = Bureau of Labor Statistics, Employment and Earnings, January 1987.

*Source = Director, Selective Service System, private communication.

**Source = Bureau of Labor Statistics, Current Population Survey (1986 twelve month averages), microdata tapes.

SIC = Standard Industrial Code (SIC) codes used:
Service: 481, 482, 489
Manufacturing: 365, 366

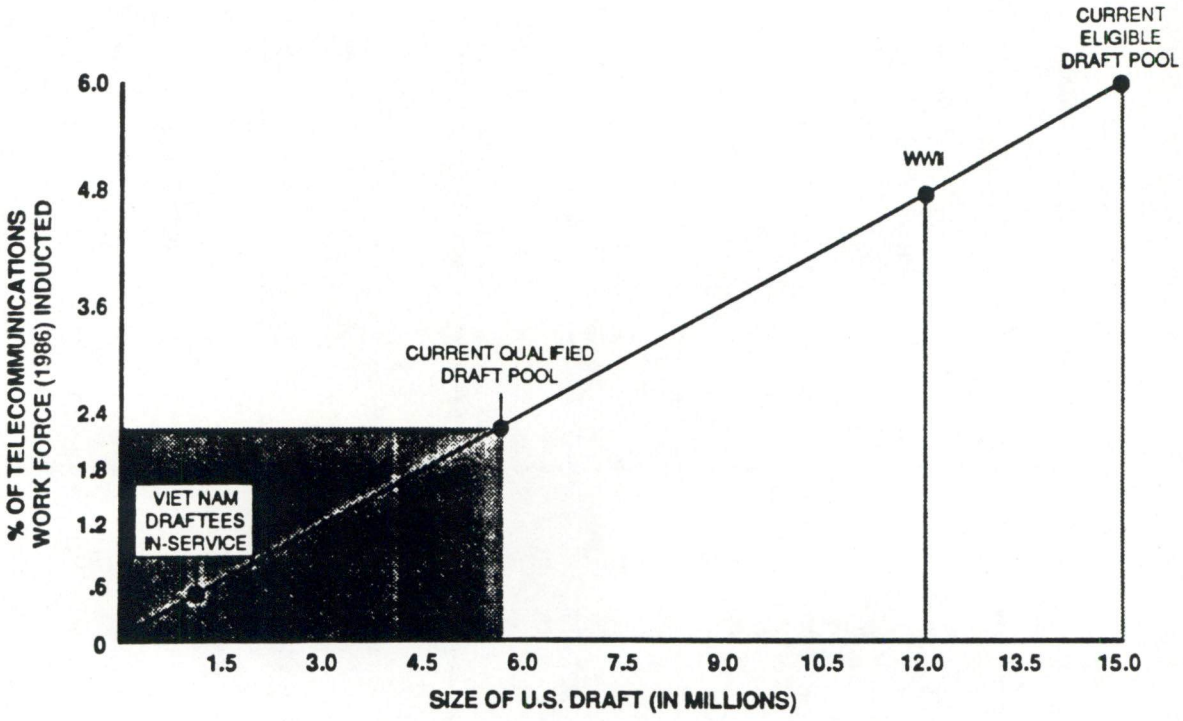

FIGURE 3-3

EXTRAPOLATED EFFECT OF THE
DRAFT ON THE TELECOMMUNICATIONS
INDUSTRY AS A RESULT OF HYPOTHETICAL
LONG-TERM FORCE REQUIREMENTS

This problem of demand exceeding supply is a result of the fact that not all individuals currently eligible for the draft (males, ages 18 through 25) will be found qualified for induction. Data from the Vietnam War indicates that only about 36 out of 100 draft-age males would be found qualified.[14] When this qualification factor is applied to the current draft-eligible population of 15,247,000, a total of only 5,489,000 potential inductees results. This is less than the World War II requirement of 12,000,000, and suggests that existing draft policies and assumptions would be subject to change under Long-Term mobilization conditions.

Figure 3-3 illustrates the results of the extrapolation of the Joint Group's Short-Term estimates to the Long-Term. The horizontal axis illustrates a range of draft levels (actual and projected), including the actual number of inductees during World War II and Vietnam and points representing national draft-eligible and draf-qualified pools, as currently defined by the SSS. The vertical axis shows the resulting percent of the telecommunications work force that would be inducted.

As indicated in Figure 3-3, the maximum number of individuals that could be inducted under current elegibility and qualification criteria is 5,489,000. This number falls about midway between the actual figures for Vietnam and World War II. At the current draft-eligible level (the high end of the range shown in Figure 3-3), the percent of telecommuniations industry personnel that could be affected rises to 6.2% (114,000 individuals).

Table 3-3 summarizes the combined effect of a call-up of the Reserves and a resumption of the draft. In the Short-Term, the total impact would be less than 2% of the telecommunications industry work force, thus confirming the Joint Group's earlier estimate. Although the Mid-Term was not analyzed due to the lack of policy guidelines, it probably would not differ significantly from the Short-Term. A call-up of the Reserves represents the dominant effect in the early stages of mobilization (1.5% versus 0.1% for the draft), and would be completed in the Short-Term.

For the Long-Term, two points along the range illustrated in Figure 3-3--current draft-qualified and current draft-eligible pools--are used as low and high estimates. Over this range (draft-qualified through draft-eligible), the impact of the draft exceeds the impact of a maximum call-up of the Reserves. Under these assumptions, the combined impact of losing both inductees and Reserve/National Guard personnel in the Long-Term could approach 4-8% of the industry work force. However, the Joint Group judged that companies would have time during the Short-and Mid-Term, when losses would be relatively small, to plan for potentially greater losses of personnel during a Long-Term mobilization. With such planning, the Group judged that the impact of these potentially greater losses of personnel would be minimal.

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[14]Vietnam-era data is the most recent. A very similar figure (1 in 3) was provided by an SSS official during a briefing to the TIM Group in response to a question.

TABLE 3-3
TOTAL NUMBER OF TELECOMMUNICATIONS INDUSTRY EMPLOYEES INDUCTED (DRAFTED) AND/OR CALLED UP

	SHORT TERM (0 - 90 DAYS)		SHORT TO LONG TERM (0 - TO BEYOND 180 DAYS)	
	Number of Employees	Percent of Employees	Number of Employees	Percent of Employees
Reserves	27,750*	1.5%	27,750	1.5%
Draft	2,250	.1%	41,000 - 114,000	2.2 - 6.2%**
TOTAL	30,000	1.6 %	68,750 - 141,750	3.7% -7.7%

*Based on 1.5% of work force, the national average. This is consistent with survey results reported above.

**Based on hypothetical Long-Term draft requirements.

Qualitative Effect

The overall qualitative effect of a military call-up on levels of service and production was also investigated by the Joint TIM Group. The telecommunications industry as a whole has not attempted to identify, for mobilization purposes, either key positions or critical occupational skills. However, an initial effort was made by the Group's industry members to identify candidate positions and skills.[15] On the basis of its preliminary findings and discussions, the Joint Group agreed that, in the Long Term (over 180 days), the loss of employees occupying critical positions could affect service and production.

Although the overall number of industry personnel potentially affected by mobilization appears small, the Group considered the possibility that the loss of a small number of employees in critical positions might have a disproportionate effect. Therefore, the Group supplemented its initial efforts to identify candidate positions and skills by including a question about "job title" in its survey of a small number of TIM industry member facilities. The resulting data was analyzed for any unusual concentration of Reserve/Guard or draft age employees in particular job or skill categories. The survey data indicated that the job title "service technicians" (Bellcore) may deserve closer study. Further, there seemed to be a slight concentration of obligated personnel in the more technical occupations, although the data on this was inconclusive.

The data also suggested that demographic factors such as age and sex vary appreciably between companies and facilities, and these factors may affect the impact of mobilization on any given facility or company.

Minimizing Personnel Losses

In investigating the effect of a military mobilization call-up on the telecommunications industry, the Joint TIM Group learned that existing Federal government policies and procedures could be used by telecommunications industry companies to minimize the loss of personnel.[16]

In the case of Reserve components, the DOD encourages employers to identify both the key technical and managerial positions within their companies and the Reserve status of employees holding such positions. Designation of key positions and screening of key employees are the principal mechanisms established to preclude conflicts between the needs of civilian activities and the military during a mobilization. Using the procedures and guidelines established by DOD, companies may, under specific conditions, recommend key employees for removal from the Ready Reserve.

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[15] See Appendix 3-E.

[16] See Appendix 3-E, DOD Directives 1200.7 and 1100.18.

In the case of potential draftees, the Joint Group initially believed that occupational deferments could be granted by the Selective Service System (SSS). The Group later learned that SSS regulations no longer provide for the granting of occupational deferments based on employment. Occupational deferments were revoked by the SSS in 1970 based on authority provided by Executive Order 11527.[17] In revoking occupational deferments, the SSS stated that "no occupations are now critical or essential to the nation..."[18] However, the Director, Selective Service, with the advice of the National Security Council, retains the authority to reinstate occupational deferments when needed. Although the procedure for granting occupational deferments is no longer in place, it could be reinstated if the telecommunications industry (as well as other industries critical to national security) could demonstrate that certain categories of their draft-eligible employees occupy positions "critical or essential to the nation". This would, however, have to be done before any mobilization began.

Summary

The Joint TIM Group concludes that a military mobilization call up would not significantly affect the telecommunications work force in the Short-and-Mid Term from either a qualitative or quantitative perspective. Although the loss of employees from a military mobilization could affect the telecommunications work force more significantly in the Long Term, adequate time is available to make provisions to compensate for any adverse effects that might occur.

3.3.2 Employee Status Tracking

In considering the effects of military mobilization on industry personnel, the original NSTAC TIM Task Force determined that up-to-date information on the draft or Reserve status of employees would enable employers to develop more precise estimates of personnel losses and their impact on company operations. However, the original Task Force also indicated that many companies are hesitant to ask for and maintain information on the draft/Reserve status of their employees.

The industry members of the Joint TIM Group also have significant reservations about maintaining records on, or even inquiring about, the current military status of employees. While telecommunications companies represented on the Joint TIM Group are supportive of the Reserve or National Guard activities of their employees and cooperate fully in granting leave to fulfill these obligations, the companies prefer that any arrangements necessary for meeting these obligations be made between the affected employee and his local management. This attitude is consistent

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[17] "Amending the Selective Service Regulations," Executive Order 11527, April 23, 1970.

[18] SSS Headquarters Local Board Memorandum No. 105, April 23, 1970.

with the prevailing philosophy within the industry of maintaining only those personnel information records required by law or necessary for company operations.

Companies are particularly concerned about seeking to obtain or record information that might expose them to charges of discrimination or invasion of privacy. Reservists are required by DOD directive[19] to inform employers of their Reserve status. However, companies are not required to maintain records of this information, and there appears to be no mechanism in place, either in Government or industry, to determine if Reservists have fulfilled this requirement. DOD maintains records on every Reservist, and each Reservist's record contains a "civilian occupation code". The code is not sufficiently detailed, however, to permit the identification of telecommunications industry personnel.

Although the Joint TIM Group has determined that an industry system for tracking the military obligation of its employees could be useful, the Group concluded that, given the estimated small number of employees initially affected, telecommunications companies would probably not establish or maintain such systems unless directed to do so by the Federal government. The Group anticipates that the estimates of affected employees will continue to be assessed during future exercises.

3.3.3 Physical Protection/Support

The original NSTAC TIM Task Force considered the possible need to physically protect and support key industry personnel under certain mobilization conditions (e.g., nuclear alert). The Joint TIM Group, however, excluded nuclear scenarios from its current study and thus addressed this question from the perspective of threats posed by systematic terrorism or sabotage under crisis or conventional war conditions.

Acts of terrorism or sabotage involving physical attacks on telecommunications facilities are conceivable under a variety of scenarios. Terrorist actions might also be directed against specific key individuals within the industry. However, in crises or other emergencies short of a nuclear attack on the United States, the Joint TIM Group agreed that there is little or no risk of attacks on the vast majority of industry personnel.

This assessment was supported by the industry members of the Group, who indicated that most telecommunications companies do not currently plan to take extraordinary measures to protect employees under non-nuclear mobilization conditions. Companies having plans to provide such protection or support are concerned primarily with nuclear attack. The need for special measures for physical protection or support of industry personnel in general under other conditions, including mobilization, is not anticipated and is not being planned for.

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[19] See Appendix 3-F.

Taking this information into consideration, the Joint TIM Group determined that there is no need for extraordinary measures to ensure the physical security and protection of industry personnel under the conditions addressed in this report.

3.3.4 Relocation/Movement of Personnel

The possible need to provide for relocation or priority movement of industry personnel was identified by the original NSTAC TIM Task Force. The question of relocating employees was judged by the Joint TIM Group as relevant only to a nuclear attack scenario and thus outside the scope of this study. However, the Joint TIM Group did consider the possible need to provide for the priority movement of industry personnel during a mobilization, either to ensure continuity of management or to carry out the installation, inspection, or servicing of telecommunications equipment. The Group also reviewed the problem of transporting a large task force of emergency workers, equipment, and supplies from their normal work site (or storage site) to the site of a major national level emergency.

The U.S. Department of Transportation (DOT) maintains a Civil Transportation Priority List that provides for the assignment of priorities for the movement of communications-related equipment under emergency conditions. At the time of the Joint Group's initial consideration of Personnel issues, the List did not provide for the priority movement of industry personnel who might be needed to install, operate, or maintain such equipment. However, DOT indicated that it would be willing to accept recommendations regarding the priority movement of key industry personnel.

DOT emergency plans do not address the question of local movement of communications equipment or movement other than by interstate, "for-hire" transportation. The Joint TIM Group reviewed potential impediments to local or short-range transportation of installers or maintenance personnel to and from field sites under emergency conditions as well as the home-to-work movement of key employees. The Group also discussed the difficulties associated with properly identifying industry personnel to local authorities and ensuring access to emergency sites. The Group concluded that, while such impediments could seriously affect industry service or manufacturing operations, they could be addressed more effectively at State and local levels than at the national level. The Group agreed, however, that FEMA should encourage State and local emergency management authorities to make provisions for emergency movement of telecommunications industry material and personnel during crisis, mobilization, or other major emergency conditions. Such provisions should also be exercised at the Command Post Exercise (CPX) level and higher.

On the basis of its review, the Joint TIM Group concluded that requirements for the priority movement of telecommunications personnel should be identified and incorporated in DOT emergency plans. The Group also concluded that, during its later study of Jurisdictional Issues, it should review, with FEMA, the State and local provisions for the priority

movement of telecommunications industry personnel and materials during mobilization. As a result of the Joint TIM Group's initial recommendations in its May 1986 report, the Office of the Manager, NCS (OMNCS) has been working with the DOT to revise the List. A draft revision is currently being reviewed within the Government.

3.3.5 Training/Skill Levels

The original NSTAC TIM Task Force raised general questions about increased training requirements and the impact of shortages of trained technicians and engineers during a mobilization effort, but concluded that it was not a priority area of concern. The training/skill level concerns identified by the original NSTAC TIM Task Force focused on the possible need to train personnel in the specific skills necessary for managing, operating, maintaining, and supplying the telecommunications industry, as opposed to training personnel to carry out their functions under mobilization conditions. The Joint TIM Group revisited these issues and reached similar conclusions.

The Joint TIM Group found that telecommunications industry organizations rely on technical schools and company training programs, including on-the-job training, for the development of their skilled technicians. Production workers are usually trained on the job or in short programs offered by employers.

The Joint TIM Group reviewed the need for training various categories of personnel to meet any losses in number, as well as any increased demands, resulting from mobilization. The Group agreed that, in general, skills training was not necessary--and could not be effectively brought to bear--in either the Short-Term (0-90 days) or Mid-Term (90-180 days). One possible exception is training for production tasks that require relatively low skill levels. In these cases, the Joint Group concluded that training programs could be conducted in the Mid-Term.

In the event of a Long-Term mobilization effort, the Joint TIM Group determined that personnel might need to be trained to replace skilled workers lost to military call-up or competing jobs. It was agreed that current training programs would continue to be available and could be operated on accelerated schedules. These programs could be staffed by personnel, including industry retirees, not subject to military call-up.

The fact that some segments of the industry are currently experiencing shortages of technicians and other qualified personnel in certain geographic areas was noted. However, these shortages are not being experienced uniformly throughout the industry and are not considered by the Group to reflect any deficiencies in existing training facilities or programs. The Group anticipates that current shortages will be relieved by the transfer and relocation of currently available personnel to affected areas and expanded/accelerated training programs.

The Joint TIM Group concluded that, in the Short- or Mid-Term mobilization time periods, there is no urgent need for new or additional training programs. For Long-Term mobilization, the Group concluded that any increased numbers of skilled personnel needed by the industry could be supplied by existing training facilities and programs, with principal reliance on technical schools and in-company training.

3.3.6 Work Force Expansion

The original NSTAC TIM Task Force also raised the general question of the possible need to expand telecommunications industry work forces in order to meet significantly increased demands for services and equipment. As in the case of training and skill levels, it was not considered by the Task Force to be a priority area of concern, but was revisited by the Joint TIM Group.

The Group determined that telecommunications industry companies currently plan for expansion of their work forces only as required to meet increases in levels of service or production resulting from normal growth. Most have not developed formal programs for expanding their work forces to meet any rapid increases in demand for service or production that would result from mobilization and associated emergency conditions.

In assessing the possible need for work force expansion under mobilization conditions, the Joint TIM Group reviewed the problem in terms of specific mobilization time periods. The Group agreed that the telecommunications industry could maintain, or even increase, present levels of service or production with work forces at their current, or slightly reduced, levels for a period of six months. Major expansion would thus not be required in the Short- or Mid-Term.

However, the Group also agreed that if mobilization lasted for a longer period during which demand for service continued to increase, an expansion of existing work forces might be required.

3.3.7 Providing for Key Personnel and Their Families

In reviewing this final question raised by the original NSTAC TIM Task Force, the Joint TIM Group determined that this concern was relevant only in a nuclear attack scenario and was therefore outside the scope of the current study. The Group noted, however, that while some telecommunications companies have limited plans and facilities for protecting key employees (i.e., those necessary for the continuity of operation and management) during and following a nuclear attack, most companies do not. Several organizations also have strong security measures in place to protect certain key personnel, particularly senior management personnel, who might be likely targets of terrorists.

Most companies do not make special provisions for protecting or sustaining key personnel and their families during mobilization or related emergency conditions. The Joint TIM Group determined that there is no need for extraordinary measures to ensure the physical security and protection of key personnel and their families under the conditions addressed in this report.

3.4 Conclusions

On the basis of the information derived from its analyses of survey, Bureau of Labor Statistics (BLS), and Selective Service System (SSS) data, the Joint TIM Group concludes that a military mobilization call-up would not significantly affect the operations of either carriers or manufacturers in the Short- and Mid-Term. Only about 2% of the industry's work force would be affected during this period. In the Long-Term, the Group concluded that a higher percentage of telecommunications industry personnel could be affected, perhaps as high as 4 - 8%. However, the Joint Group concluded that the industry would have time during the Short- and Mid-Term to plan for these potentially greater losses.

Although the Joint TIM Group determined that a system for tracking the military status of its employees could be useful, the Group concluded that, given the small estimated number of employees initially affected, telecommunications companies would probably not establish or maintain such systems unless directed to do so by the Federal government. The Group anticipates that the estimate of affected employees will continue to be assessed during future NCS and joint industry-government military and civil preparedness exercises.

The need for special measures for physical protection or support of industry personnel under conditions other than nuclear attack, including mobilization, is not anticipated and is not being planned for by the telecommunications industry. The Joint Group agreed that there is little or no risk of attacks on the vast majority of industry personnel in crises or emergencies short of a nuclear attack on the United States. Taking this information into consideration, the Joint TIM Group determined that there is no need for extraordinary measures to ensure the physical security and protection of industry personnel under the mobilization conditions addressed in this report.

On the basis of its initial work, the Joint TIM Group found that there could be impediments to the transportation of installers or maintenance personnel to and from field sites under emergency conditions. The Group concluded that requirements for the priority movement of telecommunications personnel should be identified and incorporated in DOT emergency plans. Such efforts are being carried out by DOT and the OMNCS. The Group also concluded that, during its study of Jurisdictional Issues, it should review, with FEMA, State and local government provisions for the priority movement of telecommunications industry personnel and materials during mobilization.

The Joint TIM Group concluded that, in the Short- or Mid-Term mobilization time periods, there is no urgent need for new or additional training programs. For Long-Term mobilization, the Group concluded that any increased numbers of skilled personnel needed by the industry could be supplied by existing training facilities and programs, with principal reliance on technical schools and in-company training.

The Joint TIM Group also agreed that, for a period of six months, the telecommunications industry could maintain, or even increase, present levels of service or production with work forces at their current, or slightly reduced, levels. Major expansion would thus not be required in the Short- or Mid-Term. However, the Group also agreed that if mobilization lasted for a longer period during which demand for service continued to increase, an expansion of existing work forces might be required.

The Joint TIM Group determined that there is no need for extraordinary measures to ensure the physical security and protection of key personnel and their families under the conditions addressed in this report.

3.5 Recommendations

The Joint Group offered preliminary recommendations in its initial report of May 22, 1986. These preliminary recommendations are provided in Appendix 3-G. Based on the new information and conclusions developed during the Joint Group's further study of personnel issues, the Group recommends the following:

(1) The NCS and the telecommunications industry should periodically assess the potential effects of mobilization on telecommunications industry personnel, using both military and civil preparedness exercises and real world contingencies for this purpose.

(2) If, as a result of continuing personnel impact assessment, changes are discovered in the composition of company and/or industry work forces and skill mixes, or increases are found in the estimated percentages of industry personnel affected by draft/Reserve/National Guard obligations, then individual companies should consider:

- Tracking the military obligations of their employees (i.e., potential draftees and Reservists)
- Identifying to the NCS occupational skills that they consider critical in order to seek reinstatement of occupational draft deferments
- Requesting the transfer or discharge of identified key personnel from the Ready Reserve.

APPENDIX 3-A

SUMMARY OF NSTAC TIM TASK FORCE FINDINGS

The following findings concerning personnel issues are extracted from the Final Report of the NSTAC TIM Task Force, dated September 5, 1985:

> The maintenance of key personnel in critical positions is a significant telecommunications industry mobilization concern. However, firms typically do not ask for information on employees's reserve/draft status because of possible legal ramifications (e.g., discrimination suits). Government and industry action is needed to define an acceptable method for acquiring and maintaining the information needed to determine employee status. Means for protecting key telecommunications industry personnel from competing demands for technically-trained personnel, including military demands, also need to be addressed by both government and industry.
>
> It may also be necessary for companies to move or relocate essential employees as part of a mobilization effort. The practical aspects of personnel movement (e.g., availability of vehicles and fuel or ability to pass roadblocks) also need further study.[6]

The specific questions or issues raised by the original NSTAC TIM Task Force were grouped under the following headings:

(1) Draft, Reserve, and National Guard Obligations,

(2) Employee Status Tracking Systems,

(3) Physical Protection/Support,

(4) Relocation/Movement of Personnel,

(5) Training/Skill Levels,

(6) Work Force Expansion,

(7) Providing For Key Personnel and Their Families.

APPENDIX 3-B

CATEGORIES OF RESERVISTS SUBJECT TO CALL-UP

RECALLABLE RESERVISTS

DEFINITIONS BY CATEGORY

SELECTED RESERVES

The Selected Reserve consists of units and individuals within the Ready Reserve designated as so essential to initial wartime missions that they have priority over all other Reserves. This category includes:

a. National Guard Units

Trained members of units manned and equipped to serve either as operational or as augmentation units.

b. Reserve Units

Trained members of units manned and equipped to serve either as operational or as augmentation units.

c. Reserve Individuals

(1) Individual Mobilization Augmentees (IMA). Trained individuals preassigned to an active force organization.

(2) Trainees. Members of the Selected Reserve who are serving on or scheduled for active duty for training will mobilize with their unit but will neither train nor deploy with the unit.

READY RESERVES

a. Individual Ready Reserve (IRR)

A manpower pool consisting principally of individuals who have had training and who have served previously in the Active Forces or in the Selected Reserve and have some period of military service obligation remaining.

b. Inactive National Guard (ING)

National Guard personnel in an inactive status who are attached to a specific National Guard unit but do not participate in training activities. Upon mobilization, they would mobilize with their units.

OTHER RESERVES

a. Standby Reserve

A pool of trained individuals who maintain their military affiliation without being in the Ready Reserve. These individuals are

not required to perform training and are not part of units but could be mobilized if necessary to fill manpower needs in specific skills.

b. Military Retirees

A pool of trained individuals consisting of:

Regular officers and enlistees under the age of 60 who have completed at least 20 years of active duty and are retired with pay.

Reserve officers and enlistees who are otherwise eligible for retired pay but have not reached age 60.

RECALLABLE RESERVISTS

AVAILABILITY BY SERVICE (in thousands)

CATEGORIES:	ARMY	NAVY	USAF	USMC	DOD
SELECTED RESERVES					
National Guard Units	423.1	--	112.3	--	535.4
Reserve Units	272.1	125.0	68.7	38.8	504.6
Reserve Individuals					
IMA	14.7	--	11.2	1.1	27.0
Trainees	62.8	5.5	3.8	4.3	76.4
READY RESERVES					
Inactive National Guard	9.4	--	--	--	9.4
Individual Ready Reservists	301.6	93.8	42.5	55.0	492.9
OTHER RESERVES					
Standby Reservists	0.3	9.6	28.7	2.5	41.1
Military Retirees	226.2	174.3	374.6	44.2	819.2

Source: WARMAPS - FY1987

APPENDIX 3-C

ANALYSIS OF RESERVE/NATIONAL GUARD OBLIGATIONS

INTRODUCTION

The Joint TIM Group decided to pursue several paths in investigating the effect on industry of a mobilization of Reserve/National Guard obligated personnel. One approach was to survey telecommunications personnel about their Reserve/National Guard obligations. A small, trial survey was then undertaken in conjunction with the POWER SWEEP '87 exercise to test the workability of this approach. This report documents the results of that survey.

Three TIM Group member companies volunteered to survey one of their facilities, and two other companies provided aggregate data in place of surveying a facility. Table C-1 shows the amount and type of data received from each source.

TABLE C-1
DATA SOURCES

SURVEY DATA

COMPANY	RESPONSES
AT&T	377
Bellcore	168
NTI	267

NON-SURVEY DATA

COMPANY	FACILITY SIZE
Martin Marietta	4500
Rockwell	86

This data was analyzed to determine the proportion of responding employees with Reserve/Guard obligations and whether this proportion varied across companies, job skills, or other factors. Variation by job skill, for instance, could be useful in identifying occupations unusually sensitive to a mobilization.

Several factors limit the extent to which the findings of this survey can be generalized, e.g. the small size of the trial survey and the technique of focusing on one facility from each company. Further, although the companies participating from the Joint TIM Group represent a cross section of the telecommunications industry, the sample is probably not representative for two reasons. First, the sample was drawn

---

[20]Bellcore arranged for a facility operated by a Regional Bell Operating Company to be surveyed. This report will refer to this as a "Bellcore" facility since Bellcore provides the Joint TIM Group representative.

exclusively from facilities in the Northeast. This was done purposely, with the intent that it might later be correlated with information derived from military mobilization exercises planned for that region. Second, the relative numbers of each type of facility throughout the industry is likely to differ from the one used in the survey. Finally, since the responses were purely voluntary, there is the problem of self-selection. Therefore, the results can be used only to identify possible areas of interest, rather than to develop definitive conclusions.

FINDINGS

The data shows that there are major demographic differences among the facilities. Table C-2 presents the available data by company, age, and sex. Figure C-1 displays the same data in graphic form.

The preponderance of the employees at AT&T's facility (62%) are women, while there are virtually none (2%) at the Bellcore facility. Age distributions also vary greatly. Bellcore's facility has no employees under 27, for instance, whereas 42% or the personnel at Martin Marietta's facility are in this range. These observations indicate that a military mobilization, whatever its effect in the aggregate, will affect different facilities to different extents.

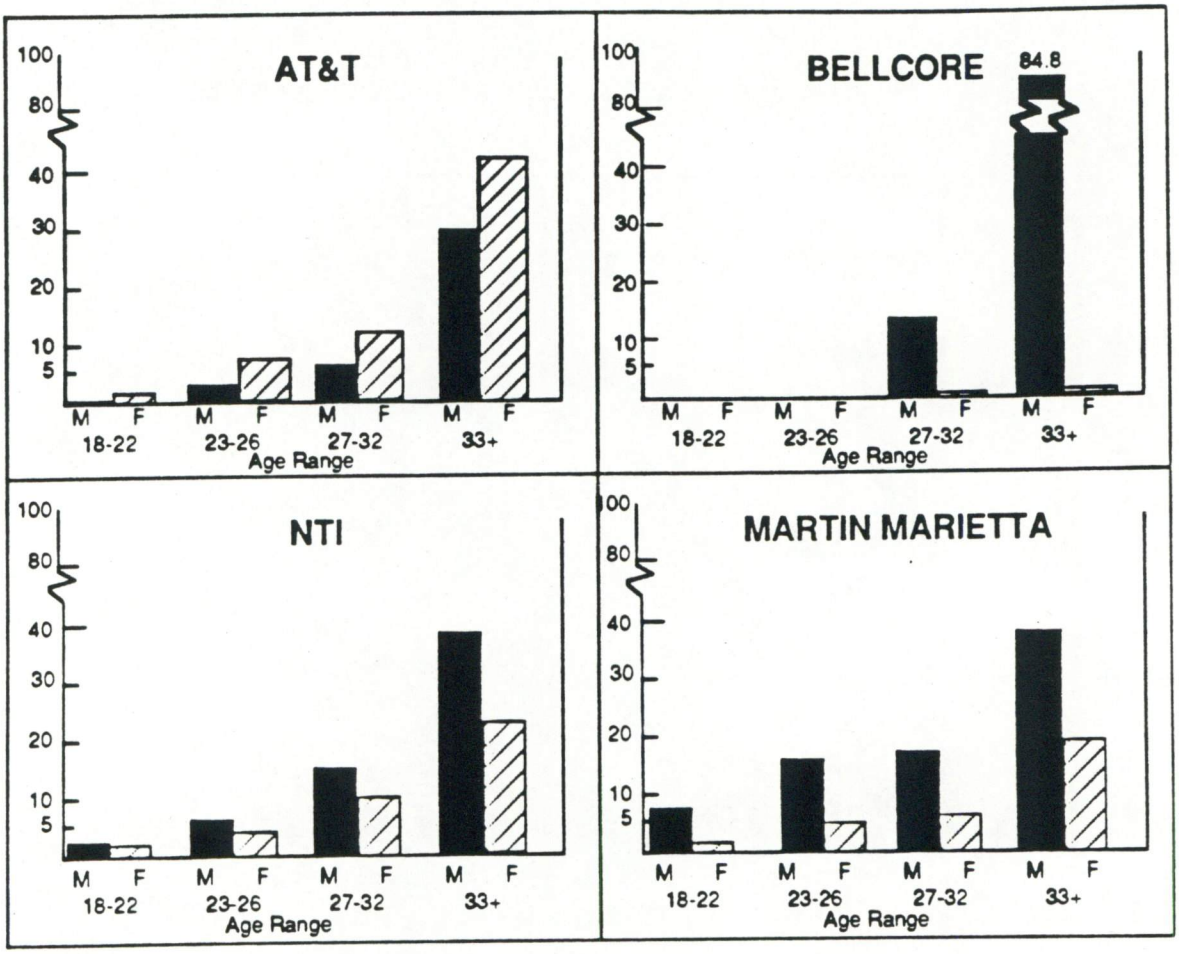
Table C-3 shows the percentages of respondents that identified a Reserve/National Guard obligation at each facility.[21] The overall percentage of surveyed personnel identified as Reserve/Guard-obligated was 2.3%. When the non-survey data is included, however, this figure drops to 1.0%. This is due to the size of the Martin Marietta sample, which tends to overwhelm the other data. The facilities split into two groups: (1) those with a relatively high percentage of obligated personnel, (Bellcore, Rockwell), and (2) those with a relatively low percentage (all others). This split tested as significant at the .95 level.

---

[21]Direct comparisons between survey and non-survey data must keep in mind the differences in how Reserve/Guard personnel were identified in each. Survey data is based on self-identification. The Martin Marietta data is based on which personnel took military leaves of absence over the last year.

TABLE C-2
EMPLOYMENT BY AGE AND SEX AT SELECTED FACILITIES

	AGE RANGE			
COMPANY	18 - 22	23 - 26	27 - 32	33+
AT&T				
Males	1	11	21	104
Females	6	25	41	153
Total	7	36	62	257
Bellcore				
Males	0	0	21	134
Females	0	0	1	2
Total	0	0	22	136
NTI				
Males	8	14	35	97
Females	5	10	26	56
Total	13	24	61	153
Martin Marietta				
Males	336	732	772	1694
Females	87	171	202	504
Total	423	903	974	2198
Grand Total				
Males	345	757	849	2029
Females	98	206	270	847
TOTAL	443	963	1119	2744



AT&T, Bellcore, and NTI data based on survey responses.
Martin Marietta (MMIC) data based on database extract.
Rockwell data did not include age/sex information

FIGURE C-1
EMPLOYMENT BY AGE AND SEX AT SELECTED FACILITIES
GRAPHIC DEPICTION

TABLE C-3
RESERVE/OBLIGATED PERSONNEL BY COMPANY

COMPANY	EMPLOYEES	RESERVE/GUARD	PERCENTAGE
AT&T	377	2	.5
Bellcore	168	11	6.5
Martin Marietta	4401	25	.6
NTI	267	6	2.2
Rockwell	86	9	10.5

In addition to estimating the percentage of personnel that would be affected by a call-up, the data was also analyzed for any indication that particular occupational skills would be disproportionately affected. This was difficult because of the great variety of job titles within and among the facilities surveyed. As Table C-4 shows, one facility had a different job title for every other employee. This is in part due to counting different grades of the same title as different titles, e.g. "Metalworker 2" would be different from "Metalworker 3".

TABLE C-4
JOB TITLE TOTALS

COMPANY	PERSONNEL	JOB TITLES
AT&T	377	74
Bellcore	168	18
NTI	267	184

The large number of job titles required that they be consolidated before any meaningful analysis could be attempted. A strawman consolidation of job titles was developed by the Joint TIM Group staff and given to the participating industry members of the Joint TIM Group for comment. The strawman consolidation attempted to group job titles into categories sharing similar functions and occupational skills. One comment was received. It suggested a matrix breakdown in which skills (clerical, technical, management) formed the rows, and functions (operations, operator services, sales/marketing, miscellaneous) formed the columns. The matrix suggested was useful for the AT&T and Bellcore facilities, but did not fit the mix of job titles at the NTI manufacturing facility, for which the staff developed a similar matrix. Subsequent analyses were performed on both the strawman and matrix groupings.[22]

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[22]The strawman breakdowns of job categories for each company and the job category matrices are included as an attachment to this Appendix.

The technique used to identify possible job categories in which a disproportionate number of Reserve/Guard personnel are employed was to test the percentages of obligated personnel in each category against the remaining employee population and against each other category.[22] This could be done for each company separately. However, it was impractical for analyzing differences, if any, between companies because each facility had a separate function and a separate set of job titles. The overall results of this analysis were:

- At Bellcore's facility, 9 out of a total of 11 Reserve/Guard employees came from the same job category, "Service Technician". This represented 10% of employees in that category and was significant at a .95 level in comparison with other categories and with the facility population at large.

- AT&T's facility had only two employees with Reserve/Guard obligations, and no meaningful groupings of such a small number for analysis were possible.

  NTI's facility had only six employees with Reserve/Guard obligations. All of these were found in the "Technical" row of the job category matrix constructed for NTI. Although this result tested as significant, it is probably not useful in identifying skills of interest because of its generality. (The "Technical" row of NTI's matrix included over 50% of its employees.)

OBSERVATIONS

The results above indicate that a mobilization of Reserve/Guard obligated personnel is likely to affect roughly 2% of the telecommunications industry's employees.[23] This is in keeping with the initial estimate of the Joint TIM Group, and compares to a national average of 1.5%.

The results also indicate, however, that the effect on individual facilities may differ considerably from the average effect. Some facilities may lose 10% or more of their employees upon mobilization, even though most lose only 2% or less. This difference is probably related to the finding that the demographics of facilities vary greatly. Therefore, although the overall figure of 2% may not give rise to concern, companies may find it prudent to periodically perform a self-assessment of the vulnerability of their individual facilities to personnel losses due to military mobilization. Because the overall loss is likely to be small, concentrated losses at individual facilities could probably be handled by transferring employees from facilities less affected.

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[22]The statistical test used is described in pages 263-265 of Probability and Statistics for Engineers and Scientists by Walpole and Myers.

[23]This figure is consistent with the proportion of national employment that is Reserve/Guard-obligated. Data from the DOD and the Bureau of Labor Statistics indicate that this is about 1.5%.

A disproportionate concentration of obligated employees was found at the Bellcore facility. Since no similar concentration was found at the other facilities, caution must be exercised in drawing conclusions from this fact. The concentration found at the one facility surveyed may be due to a hiring policy unique to that facility, may indicate that personnel with the required skills are often recruited from the Armed Service throughout the company, may reflect an aggressive recruiting effort by the National Guard/Reserve in that area (perhaps through a company employee), or may simply be an anomaly attributable to the small survey size. A further investigation of the category of Service Technicians seems called for within the company, however, since the proportion of obligated employees in this category is so large.

ATTACHMENT

STRAWMAN CONSOLIDATION OF JOB TITLES FOR AT&T

Other

_____
Account Receivable Specialist
Compensation Spec.
MSS
Marketing Support Specialist
SOT
TG-5

Clerical
Branch Secretary
Clerk
File Operator
Grade II Clerk
Grade III Clerk
Marketing Clerk
Records Clerk
Reports Clerk
Reports Clerk/FASC Consultant
Secretary District
Senior Marketing Clerk
Senior Operations Clk.
Service Order Clerk

Operator
Operator
Operator - Traffic
Operator 1st Class
Operator Services Manager
TSPS & SOST Operator
TSPS Operator

Sales
Sales Associate
Sales Manager
Sales Representative
Sales Specialist

Service
Service Assistant
Service Manager
Service Order Administrator
Service Order Administrator in MDC
Service Order Writer
Service Representative

Consultants
CSC
Communications Consultant
Communications Systems Consultant
Technical Consultant
Technical Consultant II

Technicians
Communications Technician
Communications Technology

Operations Management
Operations Manager
Operations Network Supervisor
Operations Service Manager
Operations Supervisor
Operations Supervisor Control Spec

Account
Account Executive
Account Executive IC
Account Service Representative
Account Support Representative

Misc. Management
Administrative Supervisor
Assistant Manager
Assistant Manager MDC
Assistant Manager PASC
Assistant Sales Manager PASC Syr N.Y.
Branch Manager
Data Sales Manager
District Manager _____
Consumer Sales & Marketing - Area Manager
Force Supervisor
Group Manager
Group Manager - Operator Services
Industry Manager
Manager
Manager National Services
National Account Manager

Staff Assistant Mgr.
Staff Manager
Staff Supervisor
Store Manager
Supervisor
Systems Manager
_____ Manager

STRAWMAN CONSOLIDATION OF JOB TITLES FOR BELLCORE

Cable Repair
Cable Repair Technician
Cable Repairman
Supervisor Cable Repair

Service
Service Repair Technician
Service Technician
SI & M
Service I & M
Service MTCE
Supervisor I & M

Management
Act. Supervisor
MRE Supervisor
Manager
Supervisor
Supervisor Dist. I & M

Other

D.I.R.T.
IR
Installer Technician
Network Technician

STRAWMAN CONSOLIDATION OF JOB TITLES FOR NTI

Assembly
Assembler
Assembler I
Assembler II
Assembler III
Assembly Supervisor
Supervisor P.C. Assy

Mechanical
Sheet Metal
Sheet Metal Mechanic
Maint. Group Leader
Maintenance
Mechanic

Shipping
Head Shipping
Packer
Stock Keeper II
Stockroom Clerk
Supervisor Physical Distribution

Engineering (NFI)
Engineer
Engineer 2
Engineer 4
Engineer I
Engineer Technician IV
Engineering Technician
Senior Engineer
Senior___ Engineer
Technician
Technician III
Technician V

Hardware Engineering
Hardware Design Engineer I
Hardware Engineer
Hardware Engineer III
Hardware Technician II
R & D Hardware Tech II
Technician Hardware

Clerical
Bindery Clerk
Business Systems Secretary
Clerical
Credit & Collection Clerk
Executive Assistant
H.R. Clerk
Manufacturing Document Specialist
Manufacturing Documentation Clerk 2
Operations Secretary
Order Entry Clerk
Order Processing Clerk
Payroll Clerk
Production Inventory Control Clerk
Purchasing Clerk
Receptionist
Sales Clerk II
Secretary
Secretary CS
Secretary to Controller
Supervisor Order Entry
Switchbrd Receptionist

Software Engineering
Programmer Analyst
Programmer Analyst III
Quality Software Engineer
Senior Software Engineer
Software Designer Engineer
Software Engineer
Software Engineer I
Software Engineer II
Software Engineer III
Software Intern
Software Technician III

Test
Group Leader Test
Manager Test Engineering
Test Engineer
Test Engineer I
Test Engineer II
Test Engineering Technician IV
Test Technician
Test Technician II

Misc Engineering
Applications Engineer
Customer Engineer
Electronic Technician
Firmware Technician
Group Ldr P.C. Board
Industrial Engineer
Manufacturing Engineer
Market Engineer
Mechanical Design Engineer
Printed Circuit Designer

Senior Systems Engr
Systems Engineer

Quality Control
Director QA
Group Leader QC
Q.C. Mechanical Inspector
QC Technician
Quality Analyst
Quality Audit III
Quality Control Inspector
Quality Control Inspector II
Quality Engineer
Quality Engineering Manager

STRAWMAN CONSOLIDATION OF JOB TITLES FOR NTI
(Continued)

Accounting
Accounting Clerk
Accounting Clerk II
Associate Accountant
Associate Cost Accountant
Charge Administrator
Cost Accountant II

Finance/Contracts
Contracts Administrator
Contracts Proposals Manager
Cost Analyst
Financial Analyst

Tech Writing/Training
Senior Technical Writer
Systems Training Specialist
Technical Writer
Technical Writer Q.A.
Trainer

Marketing
Account Manager
Director Marketing Services
Manager Marketing Administrator
Marketing Admin Assistant
Marketing Planner Forecaster
Marketing Research Analyst
Marketing Strategic Planning Intern
Quotes and Proposals Coordinator
Sales Administrator Assistant
System Sales
System Sales Manager
Systems Sales Manager

Graphics/Drafting
Drafter II
Drafter III
Graphic Artist
Graphic Technician II
Typesetter

Product/Project Management
CAD Systems Administrator
CAD Unit Supervisor
Dir, Business Systems
Manager Product Management
Manager Project Administration
Manager Project Management
Product Development Manager
Product Manager
Production Planner
Project Assistant
Project Coordinator
Project Manager
Senior Project Engineer

Misc Middle Management
Director
Director Technology
Group Leader
Group Leader MIS
Manager
Manager Computer Systems Support
Manager Design Services
Manager FPA & Cost
Manager M.E.
Manager Results Accounting
Manager Telecommunications
Manager of Purchases
Sales Service Manager
Senior Group Leader

Personnel
Dir, Human Resources
Employee Relations Rep
Manager Staffing
Staffing Assistant

Other

Application Person
Computer System Support Specialist
Information Resources Specialist
Intern
Bearens Operator
Buyer
Checker
Deleco Present Manager
Messenger
MTL's Manager
Management Manufacturer
Site Manager
Supervisor
TST Group Leader
Occupational Health Nurse
Operator III
Photo Technician III
Product Support Specialist
Spray Painter
System Support Specialist
System Support Specialist II
Technology Accounts Control Coordinator
Traffic Coordinator
Unit Manager
V.P. GM
VP Operations

APPENDIX 3-D

ANALYSIS OF THE IMPACT OF CONSCRIPTION ON THE U.S. TELECOMMUNICATIONS INDUSTRY

INTRODUCTION

This appendix documents the Joint TIM Group's effort to estimate the effect on telecommunications industry personnel of a resumption of the draft (i.e., "conscription") during mobilization. The purpose was to estimate the draft effect in terms of: the numbers, percentages, and age groups affected; the variation by mobilization time period; and the particular job categories that might be affected.

Currently, the Selective Service System (SSS), which implements conscription when authorized by the Congress and the President[24], maintains a registry of virtually all U.S. male citizens and certain other males residing in the United States from the ages of 18 through 25.[25] However, the SSS does not classify its 15 million plus registrants according to their draft status. Neither the individuals nor the SSS know who is qualified for conscription. In contrast to Reservists, individuals cannot identify themselves to their employers as draft-qualified, but only as draft-eligible (i.e., registered with SSS). Therefore, a statistical approach to estimating the number of telecommunications industry personnel affected had to be adopted.

The approach consisted of the following steps:

1. Estimate the potential demand on telecommunications industry personnel from a resumption of the draft

2. Estimate the supply of draft-qualified personnel employed by the telecommunications industry

3. Estimate the effect in terms of the numbers, percentages, and age groups affected. Project the magnitude of these effects from the Short-Term to the Long-Term mobilization period.

4. Identify telecommunications job categories that may be significantly affected, if any.

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[24]Induction into the Armed Forces after July 1, 1973 was revoked by the Congress in Section 467 (cc), USC. 50., Military Selective Service Act.

[25]In accordance with the definition of "between the ages of eighteen, and twenty-six" in Section 466, USC 50., Military Selective Service Act

ESTIMATE OF THE DEMAND

Two estimates of the demand from the draft were used. The current draft policy, in effect since 1980,[26] imposes a requirement on SSS to deliver 100,000 men within 30 days after mobilization is declared. A proposed policy, under consideration by the Assistant Secretary of Defense for Force Management and Personnel, is to require the SSS to deliver approximately 300,000 personnel within 90 days after mobilization is declared.[27] The current and proposed policies were used as the low and high estimates, respectively, of the draft demand. These policies apply only during the first 90 days, or Short-Term mobilization period as defined by the Joint TIM Group. No policy requirement exists beyond the Short-Term period. Therefore, historical data on past conscriptions as well as current SSS data were used to estimate possible demand during the Long Term.

To estimate the demand specific to the telecommunications industry, a basic assumption was required. That assumption was that the percentage of the U.S. draft-eligible population as a whole that is affected by a resumption of the draft also applies to the draft-eligible population within the telecommunications industry. The Group believed this to be a valid assumption because the draft is based on a random drawing (i.e., a lottery by birthdate), and therefore uniformly affects the entire draft-eligible population (for each of the single-year age groups, called-up). Therefore, the percentage demand for draft-eligible members of the telecommunications work force would be the same as the percentage demand for individuals from any other portion of the draft-eligible population.

The total number of SSS registrants --the draft-eligible population--on file during calendar year 1986 was 15,247,000. [28] The application of the low and high draft requirements of 100,000 and 300,000 respectively, results in .66% and 1.97% of the draft-eligible population affected. These <u>percentages</u> apply to the draft-eligible portion of the telecommunications industry in accordance with the basic assumption stated above. The resulting <u>number</u> of telecommunications personnel potentially affected by these percentages is discussed in the next section.

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[26]Letter from Assistant Secretary of Defense (MR&L) to Director, SSS dated November 1980.

[27]"Updating the Inductee Delivery Schedule", Report FP 601R2, Logistics Management Institute, March 1987

[28]Telephone conversation with Ms. Mary Ellen Levesque, SSS, Operations Directorate, March 1987. Also confirmed through private communication with the Director, SSS.

Since the estimate of the draft requirement for the Short-Term is expressed as a policy range, and no policy requirement is stated for the Mid-Term (90-180 days), it is assumed here that the Mid-Term requirement is also close to the requirements in this range.

For Long Term mobilization, historical and current SSS data may be used as guides. During the peak of the Vietnam War military accessions numbered over half a million per year. The largest U.S. conscription occurred during World War II. In the five years from 1941 to 1945, U.S. military force strength increased from under half a million to over 12 million. The largest portion of that expansion was as a result of conscription.[29] Finally, for purposes of estimating a maximum draft requirement, the entire 1986 draft-eligible population of 15,247,000 may be used.

ESTIMATE OF THE QUALIFIED SUPPLY

The supply of draft-qualified personnel from the telecommunications industry was estimated in two steps:

1. Determine the size of the draft-eligible population. This population was taken to be equivalent to the number of telecommunications male personnel from the ages of 18 through 25.

2. Determine the portion of the draft-eligible population that would be draft-qualified.

For Step 1., data from the Department of Labor's Bureau of Labor Statistics was used. The results of Step 1 are shown in Table D-1. Historical data from the SSS was used to perform Step 2.

To estimate the portion of the draft-eligible population that would be draft-qualified, data from the last two years of the Vietnam War was used. This data is both the most recent available and is based on a total draft population size that was about the same size as it is today. Using this data, a draft qualification factor "Q" was estimated. This factor took into account the number of personnel that would be deferred (adjusted for occupational and student deferments, which are no longer in effect); the number that would not pass the physical/mental entrance examinations; and the number today that are in the Reserves and therefore would not be drafted.[30] The numerical value of Q was estimated at .359. This means that approximately 1 out of every three draft-eligible males registered with the SSS would be found draft-qualified today. The results are shown in Table D-2.

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[29] The Draft and Public Policy: Issues in Military Manpower Procurement 1945-1970. James M. Gerhardt, Ohio State University Press, 1974.

[30] See TIM Group briefing, "Macro-Analysis: The Impact of Conscription on the U.S. Telecommunications Industry. Addendum: Back-up Data." May 20, 1987.

TABLE D-1
DRAFT ELIGIBLE POPULATION IN
THE TELECOMMUNICATIONS INDUSTRY - 1986 ANNUAL AVERAGE DATA*

(IN THOUSANDS)

	TOTAL EMPLOYMENT	TOTAL MALE EMPLOYMENT	TOTAL DRAFT AGE MALES	(PERCENT OF ALL MALES)
TELECOMMUNICATIONS	1332	747	71	(9.5%)
Service Sector (SICs +481, 482, 489)				
TELECOMMUNICATIONS	517	320	43	(13.4%)
Manufacturing Sector (SICs +365, 366)				
TOTAL INDUSTRY	1849	1067	114	(10.7%)

*Bureau of Labor Statistics. Data from current population survey microdata tapes. Results provided by the Data Services Group, March 1987.
+SICs = Standard Industrial Codes

TABLE D-2
DRAFT AGE U.S. TELECOMMUNICATIONS INDUSTRY MALES
ESTIMATED TO BE DRAFT-QUALIFIED

	NUMBER DRAFT AGE MALES (IN THOUSANDS)	Q FACTOR	DRAFT AGE MALES QUALIFIED FOR INDUCTION (IN THOUSANDS)
SERVICES SECTOR	71	.359	25.5
MANUFACTURING SECTOR	43	.359	15.4
TOTAL	114	.359	40.9

ESTIMATED EFFECT ON TELECOMMUNICATIONS PERSONNEL

The effect on telecommunications industry personnel was estimated for both the Short-Term period (see Table D-3), for which a draft requirement exists, and for the Long-Term period (see Figure D-1) for which no draft requirement exists.

Short-Term Mobilization Effects

The effect of the draft during this period was estimated by comparing the supply of draft-qualified industry personnel with the demand derived from current/proposed draft policy requirements. The demand figures were determined by applying the previously estimated percentages (.66%-1.97%) to the size of the draft-eligible population in the telecommunications services and manufacturing sectors. The results are shown in Table D-3. The overall results are that during the Short-Term phase of mobilization, only about 800 to 2,250 males employed by the industry would be drafted. The numbers are small because: a) the stated demand, relative to the total size of the draft-eligible population, is small, and b) the size of the draft-eligible telecommunications population is small. The higher number corresponds to about two-tenths of one percent of the male employees, and only slightly more than half that figure for the total employee (male and female) population. It is most likely that only 20 year olds would be affected. This is because the 20 year olds represent the first age group to be called-up, and because the supply of draft-qualified 20 year olds is, most probably, higher than the 800- 2,250 draft requirement (Table D-3).[31]

Long-Term Mobilization Effects

Although no draft requirement is stated for the period beyond 90 days, historical experience provides a rough guide. To estimate Long Term effects, a linear extrapolation was made. The extrapolation projected the percentage of todays industry population that would be affected up to the point where the entire draft-eligible population would be drafted. The extrapolation was made by multiplying successively the size of the U.S. draft requirement --beginning with the high policy requirement of 300,000-- and computing (using the established ratio of .12% per 300,000 males figure from Table D-3) the corresponding percentage of today's employee population affected. This extrapolation is presented in Figure D-1. Several points on the extrapolated line are of interest as they correspond to actual historical conscription data point. First the point at about eight times the 300,000 requirement, corresponds to the number of draft-qualified males in service near the end of the Vietnam War.[32] Third, a point at about forty times the requirement represents the maximum size of the U.S.

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[31]Note: The BLS data may not be statistically valid at the single year age range for the telecommunications industry.

[32]The Draft and Public Policy: Issues in Military Manpower Procurement 1945-1970. James M. Gerhardt, Ohio State University Press, 1974.

TABLE D-3
EFFECT OF DRAFT ON THE TELECOMMUNICATIONS INDUSTRY DURING THE SHORT TO MID-TERM

(IN THOUSANDS)

SECTOR	QUALIFIED SUPPLY	DRAFT DEMAND RANGE	DRAFT REQUIREMENT RANGE	PERCENT ALL MALES AFFECTED	PERCENT ALL EMPLOYEES AFFECTED
Service	25.5	.5 - 1.4	.5 - 1.4	< .1 - .19%	< .06 - .11%
Manufacturing	15.4	.3 - .85	.3 - .85	< .1 - .26%	< .06 - .15%
TOTAL	40.9	.8 - 2.25	.8 - 2.25	< .1 - .21%	< .06 - .12%

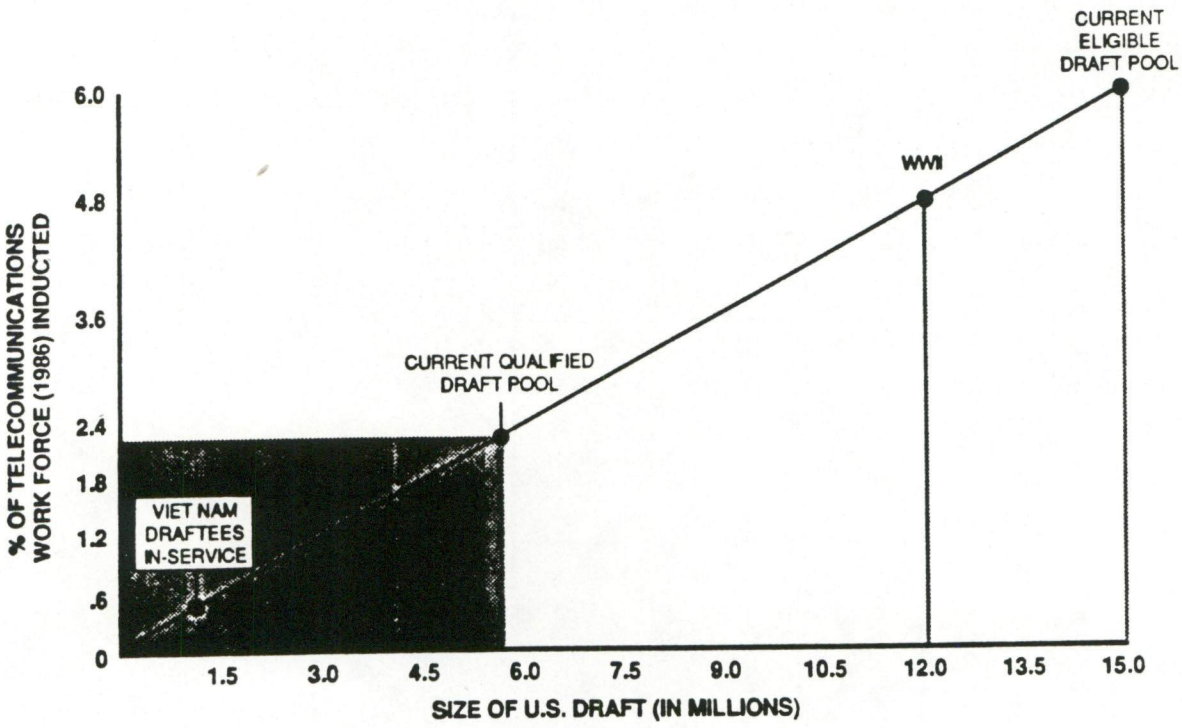

FIGURE D-1
PERCENTAGE OF THE U.S. TELECOMMUNICATIONS
WORK FORCE AFFECTED BY
VARIOUS LEVELS OF THE DRAFT

military force during the peak of World War II.[33] Finally, if the total draft-eligible population today of about 15 million were to be drafted, this would affect 6.2% of todays telecommunications population.

For purposes of estimating "worst case" impacts of the draft in the Long-Term, it is suggested that the estimates for World War II and the total draft-eligible population may be used. These estimates result in an impact in the range of about 5-6% (see Figure D-1) for the telecommunications employee population as a whole.

ESTIMATE OF AFFECTED JOB CATEGORIES

To estimate the effect of the draft on specific job categories, the TIM Group's personnel survey data was used. (See Appendix 3-C for a description of the survey methodology). Three of the four TIM industry member company facilities surveyed provided employee job title data. One of the three had no employees in the draft age range, and therefore was eliminated from this part of the analysis. Results for the remaining two companies--AT&T and NTI--are presented in Tables D-4 and D-5 below. draft-eligible employees were identified as males, ages 18-25, who were <u>not</u> members of the Reserves, and who were <u>not</u> designated as mobilization augmentees (e.g., members of the National Defense Executive Reserve.)

The findings from the analysis of the limited survey data suggest that there does not appear to be much clustering of draft affected job titles by job category, except for some of the more technically oriented categories "Technical/Sales/Marketing", "Hardware Engineering", and "Test". In general, however, the Group did not believe that the survey sample was large enough to draw any definite conclusions.

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[33] Ibid.

TABLE D-4
NUMBER OF AT&T PERSONNEL BY JOB CATEGORY

AT&T JOB CATEGORIES	NUMBER OF DRAFT ELIGIBLE EMPLOYEES/TOTAL EMPLOYEES
Clerical/Ops	1/76
Technical/Ops	1/47
Technical/Ops. Services	1/53
Technical/Sales Marketing	5/81*
Management/Misc	1/33

TABLE D-5
NUMBER OF NTI PERSONNEL BY JOB CATEGORY

NTI STRAWMAN JOB CATEGORIES	NUMBER OF DRAFT ELIGIBLE EMPLOYEES/ TOTAL EMPLOYEES
Clerical/Ops	3/25
Engineering (NFI)	1/19
Hardware Engineering	2/6*
Software Engineering	2/23
Test	2/9*
Quality Control	2/15
Other	2/45

*NOTE: Significant difference from rest of company at 95% confidence level.

APPENDIX 3-E

CANDIDATE POSITIONS/SKILLS

Q. What are the critical skills/crafts for network operations?

A. Critical Skills (not all inclusive)

- Engineering

  Central Office
  Data Systems
  Voice Systems
  Transmission
  Maintenance
  Translation

- Technicians

  Central Office Installation/Repair
  Circuit Layout
  Computer Attendant
  Repair Service
  Special Services
  Switching Equipment
  Data Systems
  Transmission Systems
  Maintenance
  Test
  Trunk
  Circuit Layout
  Repair Service
  Installation

- Installation/Construction/Maintenance/Personnel

  Cablers
  Splicers
  Installers
  Loop Maintenance
  Analog/Digital Carrier Systems
  Central Office Operations (switchman, frame, power, etc.)

- Network Management Center Personnel

- Facilities Maintenance and Administration Center (FMAC) Personnel

. Switching Control Center Personnel

. Operations Support Systems Personnel (TIRKS, ELMOS, EADAS, etc.)

These are somewhat generic titles/crafts/skills. There is variation across regions in titles. The list is not in order of importance and not all inclusive. It is intended to be illustrative of the kinds of skills the Bell Companies consider critical to the operation of their network.

Q. Which of these are currently in short supply?

A. None.

Q. What actions are being taken to address shortages today?

A. None. However, if shortages were to develop, positions could be backfilled by other personnel within the companies, much as is done during a strike situation, until new people could be trained. Adequate training programs and facilities are in place to handle not only current demands, by a very significant surge requirement.

Q. Which skills would be critical in a mobilization environment?

A. All of them. The consensus is that a short or mid-term mobilization would pose no problems and that a long-term mobilization would be dealt with with no significant problems.

Q. Percentage of male work force in 18-24 year age group.

A. About 1% (on the average).

Q. Reservists (as a percentage of male population)?

A. About 2%

Q. Annual growth rates? (Number of lines, trunks, attendant switching facilities

A. Estimated at about 3%.

APPENDIX 3-F

DOD DIRECTIVE 1200.7, SCREENING THE READY RESERVE

AND

DOD DIRECTIVE 1100.18, WARTIME MANPOWER MOBILIZATION PLANNING

Department of Defense

DIRECTIVE

April 6, 1984
NUMBER 1200.7

ASD(RA)

SUBJECT: Screening the Ready Reserve

References: (a) DoD Directive 1200.7, subject as above, November 28, 1978 (hereby canceled)
(b) Title 10, United States Code, Sections 269, 271, 272, 652, 672, 673, 674, 685, and 1005
(c) Executive Order 11190, "Providing for the Screening of the Ready Reserve of the Armed Forces," December 29, 1964
(d) through (o), see enclosure 1

A. REISSUANCE AND PURPOSE

This Directive reissues reference (a) to update and clarify DoD policy, procedures, and responsibilities governing the screening of Ready Reservists, consistent with references (b) and (c).

B. APPLICABILITY

This Directive applies to the Office of the Secretary of Defense and the Military Departments (including their reserve components). The term "Military Services," as used herein, refers to the Army, the Navy, the Air Force, the Marine Corps, and the Coast Guard (by agreement with the Department of Transportation). Reserve components include the Army National Guard, the Army Reserve, the Naval Reserve, the Marine Corps Reserve, the Air National Guard, the Air Force Reserve, and the Coast Guard Reserve.

C. DEFINITIONS

The terms used in this Directive are defined in enclosure 2.

D. POLICY

It is DoD policy that members of the Selected Reserve and other Ready Reservists who are not on active duty shall be screened at least annually to provide a Ready Reserve force composed of members who:

1. Meet Military Service wartime standards of mental, moral, professional, and physical fitness.

2. Possess the military qualifications required in the various ranks, grades, ratings, and specialties.

3. Are available immediately for active duty during a mobilization (or during a war or national emergency or in response to a presidential order to augment the active forces for an operational mission).

E. PROCEDURES

1. Reserve Component Screening Activities. The following general procedures shall be followed to ensure the immediate availability of a Ready Reserve force:

a. Annual Screening. All Ready Reservists shall be screened at least annually to ensure their availability. Upon mobilization, all screening activity ceases, and all those remaining in the Ready Reserve shall be considered immediately available for active duty service.

b. Maintaining Current Data. The development and maintenance of current information pertaining to the mobilization availability of Ready Reservists shall be the responsibility of the Secretary of the Military Department concerned.

c. Civilian Employment. After a mobilization is ordered, no deferment, delay, or exemption from mobilization will be granted to Ready Reservists because of their civilian employment.

d. Retention in the Ready Reserve. All Ready Reservists shall be retained in the Ready Reserve for the entire period of their statutory obligation or voluntary contract. Exceptions to this policy are made in this Directive or may be made by the Secretaries of the Military Departments (10 U.S.C. 269, reference (b)).

e. Transfer of National Guard Members to the Standby Reserve. In accordance with section 269(g) of reference (b), a member of the Army National Guard or the Air National Guard may be transferred to the Standby Reserve only with the consent of the governor or other appropriate authority of the state, commonwealth, or territory concerned (including the District of Columbia).

f. Transfer from the Standby Reserve to the Ready Reserve. Under section 272 of reference (b), any eligible member of the Standby Reserve may be transferred back to the Ready Reserve when the reason for the member's transfer to the Standby Reserve no longer exists (DoD Directive 1200.15, reference (d)).

g. Extreme Hardship. The Secretaries of the Military Departments shall screen extreme hardship cases (section 271a(5) of reference (b)). Ready Reservists whose immediate recall to active duty during an emergency would create an extreme personal or community hardship shall be transferred to the Standby Reserve or the Retired Reserve or shall be discharged, as appropriate.

h. Miscellaneous Screening Requirements. Ready Reservists identified in the following categories shall be processed as follows:

(1) Civilian Employment Restrictions. Ready Reservists who are also DoD civilian employees may not hold a mobilization assignment to the same

positions that they fill as civilian employees. These Ready Reservists shall be reassigned or transferred, as appropriate. Reserve component unit civilian technicians, as members of reserve units, are excluded from this provision.

(2) Theological Students. Ready Reservists who are preparing for the ministry in an accredited theological or divinity school cannot be involuntarily called to active duty or required to participate in inactive duty training (10 U.S.C. 685, reference (b)). Accordingly, such Ready Reservists (other than those participating in a military Chaplain Candidate or Theological Student Program) shall be transferred to the Standby Reserve (active status) for the duration of their ministerial studies at accredited theological or divinity schools. Ready Reservists participating in a military Chaplain Candidate or Theological Student Program may continue their Ready Reserve affiliation and engage in active duty and inactive duty training.

(3) Health Care Professionals. Ready Reservists may not be transferred from the Ready Reserve solely because they are students, interns, residents, or fellows in the health care professions. Upon mobilization, they either shall be deferred or shall be mobilized in a student, intern, resident, or fellow status until qualified in the appropriate military specialty as prescribed by the Military Department Secretaries (DoD Directive 1215.4, reference (e)).

i. Availability Determinations. The Secretaries of the Military Departments shall make determinations for mobilization availability on a case-by-case basis, consistent with this Directive, and not by class or group determinations.

j. Removal Determinations. Under this Directive, the Secretaries of the Military Departments shall review recommendations for removal of employees from the Ready Reserve submitted by employers and shall take appropriate action.

2. Screening Activities by Employers of Ready Reservists. In addition to the Ready Reserve screening activities prescribed in this Directive to be conducted by the Military Departments, employers of Ready Reservists also have certain screening responsibilities under the law.

a. Nonfederal Employers. Under 44 CFR 333 (reference (f)), nonfederal employers of Ready Reservists, particularly in the fields of public health and safety and defense support industries, are encouraged to adopt personnel management procedures designed to preclude conflicts between the emergency manpower needs of civilian activities and the military during a mobilization. Employers also are encouraged to use the federal key position guidelines contained herein for making their own key position designations and, when applicable, for recommending key employees for removal from the Ready Reserve.

b. Federal Employers. Federal Preparedness Circular (FPC) 4 (reference (g)) promulgated policy for Ready Reserve screening activities that shall be accomplished by federal sector employers. To ensure that federal employees

essential to the continuity of the federal government are not retained as members of the Ready Reserve, the following procedures shall apply:

(1) Key Positions. Some federal employees occupy positions that cannot be vacated during a national emergency or mobilization without seriously impairing the capability of their agency to function effectively. Because of the essential nature of these positions, the federal agency head, or designee, concerned shall designate such positions as key positions and shall require that they not be filled by Ready Reservists to preclude such positions from being vacated during a mobilization. The Military Department Secretaries shall transfer Ready Reservists occupying key positions to the Standby Reserve or the Retired Reserve or shall discharge them, as appropriate, under 10 U.S.C. 271(b) (reference (b)). However, reserve officers with a remaining military service obligation at the time of their removal from the Ready Reserve may be transferred only to the Standby Reserve, Active Status (section 1005 of reference (b)).

(2) Key Position Designation Guidelines. In determining whether or not a position should be designated as a key position, the following questions should be considered by the federal agency concerned:

(a) Can the position be filled in a reasonable time after mobilization?

(b) Does the position require technical or managerial skills that are possessed uniquely by the incumbent employee?

(c) Is the position associated directly with defense mobilization?

(d) Does the position include a mobilization or relocation assignment in an agency having emergency functions as designated by E.O. 11490 (reference (h))?

(e) Is the position directly associated with industrial or manpower mobilization as designated in reference (h) and E.O. 10480 (reference (i))?

(f) Are there other factors related to national defense, health, or safety that would make the incumbent of the position unavailable for mobilization?

3. Removal Recommendations. All employers who determine that a Ready Reservist is a key employee, in accordance with the guidelines contained in this Directive, promptly should report that determination to the cognizant reserve personnel center, requesting the employee be removed from the Ready Reserve. The letter format shown in enclosure 3 should be used for such recommendations and should be mailed to the cognizant reserve personnel center listed in enclosure 4. All the information shown in the letter format should be provided so the reserve personnel center can assess properly the matter and take appropriate action.

4. Resolution of Conflicting Manpower Needs. In accordance with 44 CFR 333 (reference (f)), the Federal Emergency Management Agency (FEMA) has the authority

to adjudicate, before mobilization, conflicts between the mobilization manpower needs of the civilian sector and the military that the Ready Reserve screening process has identified but has not resolved.

5. Individual Responsibilities of Ready Reservists

a. Each Ready Reservist who is not a member of the Selected Reserve is obligated to notify the Secretary of the Military Department concerned of any change of address, marital status, number of dependents, or civilian employment and any other change that would prevent the member from meeting mobilization standards prescribed by the Military Service concerned (10 U.S.C. 652, reference (b)).

b. All Ready Reservists shall inform their employers of their Reserve military obligation.

F. RESPONSIBILITIES

1. The Assistant Secretary of Defense (Reserve Affairs) (ASD(RA)) shall manage and control the overall Ready Reserve screening program in accordance with section 271 of reference (b), E.O. 11190 (reference (c)), and House Appropriations Committee Report 95-451 (reference (j)).

2. The Secretaries of the Military Departments shall:

a. Screen, at least annually, all Ready Reservists under their jurisdiction to ensure their immediate availability for active duty.

b. Ensure that personnel records systems incorporate information on any factors that limit the mobilization availability of a Ready Reservist.

c. Ensure that all Ready Reservists have a favorably completed National Agency Check (NAC) or Entrance National Agency Check (ENTNAC) on file.

d. Ensure that Ready Reservists not on active duty are examined as to physical fitness in accordance with DoD Directive 1205.9 (reference (k)).

e. Process members of the Ready Reserve who do not participate satisfactorily in accordance with DoD Directives 1200.15, 1215.5, and 1215.13 (references (d), (l), and (m)).

f. Transfer Ready Reservists identified as occupying key positions to the Standby Reserve or the Retired Reserve or discharge them, as appropriate.

g. After making a removal determination in response to a petition for such action, promptly transmit the results of that determination to the Ready Reservist concerned and his or her employer.

G. INFORMATION REQUIREMENTS

The ASD(RA) shall provide:

1. Federal agencies with a listing of all federal employees who are also Ready Reservists to assist them in conducting employer screening activities

required in FPC-9 (reference (g)). Responses from federal agencies shall be reported under Interagency Report Control Number 0912-DoD-AN. Standard data elements shall be used in the report in accordance with DoD Directive 5000.11 (reference (n)).

2. The House Appropriations Committee with an annual report on the status of Ready Reservists employed by the federal government.

H. EFFECTIVE DATE AND IMPLEMENTATION

This Directive is effective immediately. Forward two copies of implementing documents to the Assistant Secretary of Defense (Reserve Affairs) within 120 days.

William H. Taft IV

WILLIAM H. TAFT, IV
Deputy Secretary of Defense

Enclosures - 4
1. References
2. Definitions
3. Letter Format to Cognizant Reserve Personnel Center for Requesting That Employee Be Removed from the Ready Reserve
4. List of Reserve Personnel Centers to Which Reserve Screening Determination and Removal Requests Shall Be Forwarded

REFERENCES (continued)

(d) DoD Directive 1200.15, "Assignment to and Transfer Between Reserve Categories, Discharge from Reserve Status, Transfer to the Retired Reserve and Notification of Eligibility for Retired Pay," February 16, 1973
(e) DoD Directive 1215.4, "Medical Training in the Reserve Components," January 26, 1983
(f) Federal Emergency Management Agency Regulations, "Peacetime Screening," Chapter 1 (44 CFR 333)
(g) Federal Preparedness Circular (FPC) 9, "Federal Employees Who Are Members of the Military Ready Reserve," March 27, 1979
(h) Executive Order 11490, "Assigning Emergency Preparedness Functions to Federal Departments and Agencies," October 28, 1969
(i) Executive Order 10480, "Further Providing for the Administration of the Defense Mobilization Program," August 14, 1953
(j) House Appropriations Committee Report 95-451, pp. 63-66
(k) DoD Directive 1205.9, "Physical Examinations and Annual Certificates of Physical Condition of Reservists, as Required by Section 1004(a), Title 10, U. S. Code," October 6, 1960
(l) DoD Directive 1215.5, "Participation in Reserve Training Programs," May 25, 1979
(m) DoD Directive 1215.13, "Unsatisfactory Performance of Ready Reserve Obligation," June 30, 1979
(n) DoD Directive 5000.11, "Data Elements and Data Codes Standardization Program," December 7, 1964
(o) Title 3, United States Code, Section 19

DEFINITIONS

1. Defense Support Industry. Any business or corporation so determined by FEMA.

2. Extreme Community Hardship. A situation that, because a reservist is mobilized, may have a substantially adverse effect on the health, safety, or welfare of the community. Any request for a determination of such hardship shall be made by the reservist and must be supported by documentation as required by the Secretary of the Military Department concerned.

3. Extreme Personal Hardship. An adverse impact upon a reservist's dependents resulting from his or her mobilization. Any request for a determination of such hardship shall be made by the reservist and must be supported by documentation as required by the Secretary of the Military Department concerned.

4. Key Employee. Any federal employee occupying a key position.

5. Key Position. A federal position that cannot be vacated during a national emergency or mobilization without seriously impairing the capability of the parent federal agency or office to function effectively. There are three categories of federal key positions. The first two categories are, by definition, key positions. Only the final category requires a case-by-case determination and designation:

a. The Vice President of the United States or any official specified in the order of presidential succession as set forth in 3 U.S.C. 19 (reference (o)).

b. Members of Congress, heads of federal agencies appointed by the President with the consent of the Senate, and the federal judiciary (District, Circuit, and Supreme Court judges and justices only; all other positions within the federal judiciary shall be considered under the provisions of paragraph c. below). For the purpose of the definition contained in this paragraph, the term "heads of federal agencies" does not include any person appointed by the President with the consent of the Senate to a federal agency as a member of a multimember board or commission. Positions occupied by such persons may be designated as key positions only by the application of the criteria set forth in paragraph E.2.b. of the basic Directive.

c. Other federal positions determined by federal agency heads, or their designees, to be key positions in accordance with the guidelines specified in paragraph E.2.b. of the basic Directive.

6. Ready Reserve. Units and individual reservists liable for active duty as outlined in 10 U.S.C. 672 and 673 (reference (b)).

7. Selected Reserve. Part of the Ready Reserve of each reserve component consisting of units and individuals who participate actively in paid training periods and serve on paid active duty for training each year.

8. Standby Reserve. Units or members of the reserve components, other than those in the Ready Reserve or Retired Reserve, who are liable for active duty as provided in sections 672 and 674 of reference (b).

(Date)
(YYMMDD)

LETTER FORMAT TO COGNIZANT RESERVE PERSONNEL CENTER
REQUESTING THAT EMPLOYEE BE REMOVED FROM THE READY RESERVE

From: (employer-agency or company)

To: (appropriate reserve personnel center)

Subject: Request for Employee to Be Removed from the Ready Reserve

This is to certify that the employee identified below is vital to the nation's defense efforts in (his or her) civilian job and can't be mobilized with the Military Services in an emergency for the following reasons:

Therefore, I request that (he or she) be removed from the Ready Reserve and that you advise me accordingly when this action has been completed.

The employee is:

Name of employee (last, first, M.I.)
Military grade and reserve component
Social security number
Current home address (street, city, state, and ZIP code)
Military unit to which assigned (location and unit number)
Title of employee's civilian position
Grade or salary level of civilian position
Date (YYMMDD) hired or assigned to position

Signature and Title of Agency or Company Official

LIST OF RESERVE PERSONNEL CENTERS TO WHICH RESERVE SCREENING DETERMINATION AND REMOVAL REQUESTS SHALL BE FORWARDED

Army National Guard and Army Reserve

Headquarters
Department of the Army
ATTN: DAPE-PSM
Washington, D.C. 20310

Naval Reserve

Officers: Commander
Naval Military Personnel Center
Attention: NMPC-911
Washington, D.C. 20370

Enlisted: Commanding Officer
Naval Reserve Personnel Center
New Orleans, LA 70149

Marine Corps Reserve

Commandant (Code RES)
Headquarters, U.S. Marine Corps
Washington, D.C. 20380

Air Force Reserve

Commander (ARPC/DP)
Air Reserve Personnel Center
7300 East First Avenue
Denver, CO 80280

Air National Guard

Submit requests to the adjutant general of the appropriate state, commonwealth, or terrority (including the District of Columbia).

Coast Guard Reserve

Commandant (G-RA/55)
U.S. Coast Guard Headquarters
2100 Second St. SW
Washington, D.C. 20593

Department of Defense
DIRECTIVE

January 31, 1986
NUMBER 1100.18

ASD(FM&P)

SUBJECT: Wartime Manpower Mobilization Planning

References: (a) DoD Directive 1100.18, "Wartime Manpower Planning" August 26, 1980 (hereby canceled)
(b) DoD Directive 1100.4, "Guidance for Manpower Programs," August 20, 1954
(c) DoD Instruction 1100.19, "Wartime Manpower Planning Policies and Procedures," August 3, 1982

A. REISSUANCE AND PURPOSE

This Directive reissues reference (a) and updates policies for manpower mobilization planning during peacetime and manpower utilization during wartime. It directs the establishment of a standard DoD-wide method for computing and portraying projected wartime manpower demand and supply.

B. APPLICABILITY

This Directive applies to the Office of the Secretary of Defense (OSD), the Military Departments, the Organization of the Joint Chiefs of Staff (OJCS), the Inspector General of the Department of Defense (IG, DoD), and the Defense Agencies (hereafter referred to collectively as "DoD Components") as well as the Coast Guard, when planning to meet its responsibilities while operating within the Department of the Navy.

C. POLICY

1. During peacetime, the DoD manpower mobilization planning policy is to:

a. Provide an adequate military and civilian inventory for each occupation and experience level to satisfy projected mobilization or wartime manpower demands that cannot be met with personnel acquired after mobilization.

b. Use a mix of military and civilian manpower capable of satisfying mobilization or wartime demands, consistent with DoD Directive 1100.4 (reference (b)).

c. Obtain the authorities and establish the management procedures necessary to provide reasonable assurance that both military and civilian mobilization or wartime manpower demands can be satisfied.

d. Ensure that plans include the optimum priority for the wartime use of manpower (i.e., determine in peacetime whether a particular individual occupying a critical civilian position in the public or private sector will or will not be subject to recall to military duty because of membership in the Ready Reserve or the Standby Reserve, or as a military retiree).

e. Ensure that the Military Services and Commanders In Chief plan for the effective retention or replacement in wartime of civilian employees and contractor personnel who are performing critical support activities.

f. Ensure that continuous reviews are made of the effective wartime use of minimally disabled or over-age personnel with current or prior Military Service, including the study of assignments that directly support State Defense Forces, Civil Defense or other aspects of the internal defense of the United States and its possessions.

2. During mobilization or wartime, the DoD manpower utilization policy is to:

a. Terminate or defer activities not essential to the war effort in order to permit the reallocation of personnel to higher priority tasks.

b. Assign military personnel only to those jobs that contribute to the war unless:

(1) Military incumbency is required by law.

(2) Possessing military-unique skills or experience is essential for successful performance of required duties.

(3) Military authority or discipline is requisite to the position.

(4) Alternative manpower is not available.

c. Upon mobilization, cease all screening, removal, deferral, and exemption actions for those reservists and retired members who are subject to recall during mobilization or wartime.

d. Upon mobilization, order to active duty all Ready Reservists, active duty military retirees, other reservists, and reserve military retirees, not occupying jobs critical to National Security objectives, required to meet the mobilization or wartime needs of the contingency.

e. Expeditiously detail or reassign civilians to vacant positions to make optimal use of their skills consistent with mobilization or wartime priorities and with the mobilization or wartime authorities and procedures in effect.

f. Integrate civilians with needed skills into the military at the appropriate grade level using expeditious lateral entry procedures.

g. Encourage civilian employees who occupy emergency-essential (E-E) positions and contractor personnel who are performing critical support activities overseas to remain in the theater.

h. Hire additional civilian employees or exercise contingency contracts to do essential work not requiring military-unique experience.

D. RESPONSIBILITIES

1. The Assistant Secretary of Defense (Force Management and Personnel) (ASD(FM&P)) shall:

a. Establish DoD wartime manpower mobilization planning guidance and coordinate manpower mobilization plans and their execution.

b. Establish a standard DoD-wide procedure and data base for computing, compiling, projecting, and portraying the time-phased wartime manpower demand and supply of all DoD Components.

c. Publish guidance necessary for operating the Wartime Manpower Mobilization Planning System (WARMAPS).

d. In conjunction with the Assistant Secretary of Defense (Reserve Affairs) (ASD(RA)), the Service Secretaries and the Chairman, Joint Chiefs of Staff (JCS), direct a continuous review of DoD manpower utilization plans and programs, and develop suggested programs to enhance the effectiveness and productivity of military and civilian manpower across the spectrum of DoD missions.

2. The Heads of DoD Components shall:

a. Ensure that the policies in this issuance are reflected in all relevant issuances and procedures.

b. Develop, maintain, and submit wartime manpower demand and supply data as prescribed in DoD Instruction 1100.19 (reference (c)).

c. Conduct a continuous review of manpower utilization plans and programs for their components, and develop programs to enhance the effectiveness and productivity of military and civilian manpower across the spectrum of component missions, as directed by the ASD(FM&P) in conjunction with the ASD(RA) and the Chairman, JCS.

E. EFFECTIVE DATE

This Directive is effective immediately.

William H. Taft, IV
Deputy Secretary of Defense

APPENDIX 3-G

INITIAL TIM GROUP RECOMMENDATIONS

In its initial report on Personnel Issues, the Joint TIM Group recommended:

(1) The NCS and the telecommunications industry should participate in exercises to assess the Joint TIM Group's personnel conclusions.

(2) If exercise results show tracking of military obligations of personnel is necessary, then the Joint TIM Group should revisit this issue at a later date.

(3) To meet Long-Term mobilization requirements:

- Industry should identify critical occupational skills

- NCS should coordinate within the Federal government to authorize draft deferments

(4) The NCS should work with the U.S. Department of Transportation and the telecommunications industry to identify requirements for the priority movement of industry personnel and to update telecommunications-related assignments in the DOT Civil Transportation Priority List.

(5) During its study of Jurisdictional Issues (Federal, State, local), the Joint TIM Group should review State and local provisions for the priority movement of telecommunications industry personnel and vehicles.

4.0 TELECOMMUNICATIONS SERVICE SURGE REQUIREMENTS (STATUS REPORT)

June 1988

TABLE OF CONTENTS

LIST OF FIGURES

EXECUTIVE SUMMARY

Planning for the satisfaction of the surge in telecommunications service requirements anticipated under mobilization conditions is a complex undertaking, requiring substantial industry and government interaction. The subject of Telecommunications Service Surge Requirements was thus identified as one of the first of seven subjects to be addressed by the Joint Government-Industry Telecommunications Industry Mobilization (TIM) Group, which is charged to: (1) identify possible impediments to effective telecommunications industry mobilization and mobilization planning and (2) assist in the development of corrective actions to overcome any identified impediments.

The Joint TIM Group has approached telecommunications service surge requirements from two perspectives:

(1) The type and quantity of Federal Government telecommunications service surge requirements under mobilization conditions, and

(2) The estimated capability of industry to meet Federal Government telecommunications service surge requirements under mobilization conditions.

The Joint Group has been briefed on the ongoing National Security Emergency Preparedness (NSEP) Telecommunications Requirements Analysis being conducted by the NCS. The Group has also made an effort to estimate industry's capacity to meet a mobilization service surge, and incorporated surge requirements events in the POWER SWEEP '87 and the PROUD SCOUT '88/REX-88 ALPHA exercises. In addition, the Group has worked with the U.S. Army 7th Signal Command to develop an approach for identifying and quantifying mobilization center requirements.

Preliminary Conclusions

On the basis of its findings to date, the Joint Group has drawn preliminary conclusions in three areas: (1) industry service surge capability, (2) industry network management capability, and (3) military mobilization center requirements.

In the area of industry service surge capability, the preliminary conclusions are based upon (1) an assessment of the World War II mobilization experience and (2) projections of future service capacity and demand. The Group determined that, during the World War II period, service plant capacity was not increased in proportion to the imposed demand for service. Although the overall telecommunications system was probably saturated, it continued to function because existing facilities were more intensively used and because use of the system was voluntarily constrained.

In terms of projected plant capacity and demand, the Group has concluded that the current situation is different than the World War II mobilization period. Intercity/interlata network plant capacity is not saturated and is growing at a rate that exceeds the growth of current demand. The dual impetus of competition and technology will probably cause this trend to continue in the future. Therefore, the Group has drawn the preliminary conclusion that, on an overall basis, the Telecommunications Industry would be able to meet the increases in demand expected during a mobilization period. Despite this overall capacity, however, problems in meeting particular Government needs could arise.

In the area of Industry network management capability, Industry network management control systems appear to be capable of handling surges on the Public Switched Network (PSN). This conclusion is based on the Group's current general understanding of surge demand rather than on any quantified statement of surge demand under mobilization conditions. On the basis of the Group's investigation of network management capabilities, it has concluded that:

- Current network management tools can accommodate significant increases in traffic demand;

- Current network management controls can help to ensure that users get service, although some may have a lesser grade of service than others;

- Additional controls will develop as technology evolves, and Industry is continuing to invest in advanced technology network management tools to increase network efficiency.

The Joint Group has also concluded that Industry network management control systems are essential to effective mobilization response and, accordingly, worthy of further, more detailed investigation. The NSTAC's Telecommunications Systems Survivability (TSS) Task Force is currently examining network management techniques, capabilities, and issues. The Joint TIM Group believes that the specific and unique characteristics of a mobilization service surge should be recognized in these investigations.

On the basis of a preliminary examination of the communications annexes to military mobilization centers' mobilization plans, the Group has concluded that many or most of these annexes are outdated and/or lack the level of detail needed to obtain new telecommunications services on an expedited basis, i.e., through the use of the NSEP Telecommunications Procedures. Current annexes may, for example, not accurately identify the providers of current services if the annexes have not been updated since the divestiture of the Bell Operating Companies from AT&T.

On the basis of further information provided by the U.S. Army 7th Signal Command, the Group also believes that the ability of military mobilization centers and installations to gain access to the PSN under mobilization conditions is a matter of significant concern. While existing Federal government emergency procurement procedures can be used to facilitate emergency acquisition of services and equipment, the Group believes that the effective use of these procedures to ensure the end-to-end provisioning of service in a timely manner is dependent on the pre-identification of specific surge requirements by mobilization centers and installations. Where possible, prepositioning of plant may be in order if these procedures are considered too slow to implement.

Next Steps

The results of the crisis/mobilization phase of the NSEP Telecommunications Requirements Analysis have been made available to the Joint Group in summary form. The Joint TIM Group has determined that these results have limited applicability to TIM concerns, and lack sufficient detail to permit an in-depth analysis of the Government's mobilization surge requirements. Accordingly, the Joint TIM Group will continue to seek additional specific information on service and equipment requirements under mobilization conditions to supplement the Requirements Analysis data.

In addition, the Joint Group's investigations to date have highlighted the importance of examining the estimated quantity, nature, and distribution of particular Government mobilization requirements. The Group is currently working with the U.S. Army 7th Signal Command to identify and quantify, by means of a special survey, the service and equipment requirements anticipated by major mobilization centers and installations. The Joint TIM Group will then use this information to assess the ability of telecommunications service and equipment providers to satisfy these mobilization requirements.

Recommendations

The NSTAC's Telecommunications Systems Survivability (TSS) Task Force is conducting a detailed study of network management techniques, capabilities, and issues. The Joint TIM Group recommends that the IES request the TSS Task Force to consider the specific impact of mobilization surge requirements in their study, making use of the information developed to date by the Joint Group.

4.1 Introduction

The Joint Industry-Government Telecommunications Industry Mobilization (TIM) Group was established by the President's National Security Telecommunications Advisory Committee (NSTAC) and the National Communications System (NCS) Committee of Principals (COP) to:

(1) Identify possible impediments to effective telecommunications industry mobilization and mobilization planning, and

(2) Assist in the development of corrective actions to overcome any identified impediments.

Planning for the satisfaction of the major surge in telecommunications service requirements anticipated under mobilization conditions is a complex undertaking, requiring substantial Industry and Government interaction. The subject of Telecommunications Service Surge Requirements was thus identified as one of the first of seven subjects to be addressed by the Joint TIM Group. Reports on the status of the Joint Group's study of Telecommunications Service Surge Requirements were provided to the NSTAC in May 1986, February 1987, and November 1987; and to the NCS COP in July 1986, March 1987 and December 1987. This report supersedes these earlier reports, presenting the Group's findings and preliminary conclusions through June 1988, and outlining its anticipated next steps.

4.2 Background/Approach

In December 1984, the NCS asked the NSTAC to assist the Government in assessing Telecommunications Industry mobilization and mobilization planning capabilities. In response to the Government's request, the NSTAC charged its Industry Executive Subcommittee (IES) to assist the Government in bringing the issue into sharper focus and to develop recommendations regarding a future role for NSTAC in the area of Telecommunications Industry mobilization. The IES, in turn, established a TIM Task Force and instructed it to develop a TIM issue statement.

The TIM Task Force defined and clarified the Telecommunications Industry mobilization issue, identifying seven areas for further study by Industry and Government, including Telecommunications Service Surge Requirements. The findings of the TIM Task Force in the area of telecommunications service surge requirements were included in a two-volume report and presented for review and approval at the October 9, 1985 meeting of the NSTAC[1]. The NSTAC subsequently charged its IES to

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[1] Final Report of the Telecommunication Industry Mobilization (TIM) Task Force, Volume 1, "TIM Issue Statement," and Volume 2, "Background and Supporting Materials, " September 5, 1985.

assist the NCS in addressing the seven mobilization subjects identified, including service surge requirements.

For study purposes, the Joint TIM Group uses the definition of mobilization developed by the original NSTAC TIM Task Force:

> The process of marshalling those telecommunications resources needed to make the transition from a normal state to a state of readiness for war or other national emergency.[2]

Mobilization is considered by the Joint TIM Group to encompass peacetime/disaster/crisis through subsequent conventional military actions external to the continental United States, as illustrated in Figure 4-1. The impact of a nuclear attack on the United States has been judged by the Joint Group to be outside the scope of its study. In addition, the following mobilization time periods are being used by the Group:

(1) Pre-mobilization: Planning and Pre-Positioning

(2) Short-Term: 0 to 90 Days (Reallocation and Reprioritization of Existing Capability and Service)

(3) Mid-Term: 90 to 180 Days (Reallocation and Reprioritization of Products and Services in the Pipeline)

(4) Long-Term: Over 180 Days (Expanded Production of Capacity and Services)

In its Final Report to the NSTAC, the original TIM Task Force summarized its concerns in the telecommunications service surge requirements area as follows:

> Mobilization activity in response to a national emergency will produce a major surge of telecommunications service needs. The surge in demand for service will translate into increased requirements for trained personnel, equipment, and spare parts in the service sector as well as increased production levels in the manufacturing sector. Of particular concern is the potential for using any excess Industry capacity to satisfy surge demands.
>
> Planning for the satisfaction of these increased demands is a complex undertaking, requiring substantial Industry-Government interaction. Reasonable estimates

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[2] Final Report of TIM Task Force, Volume I, p.5

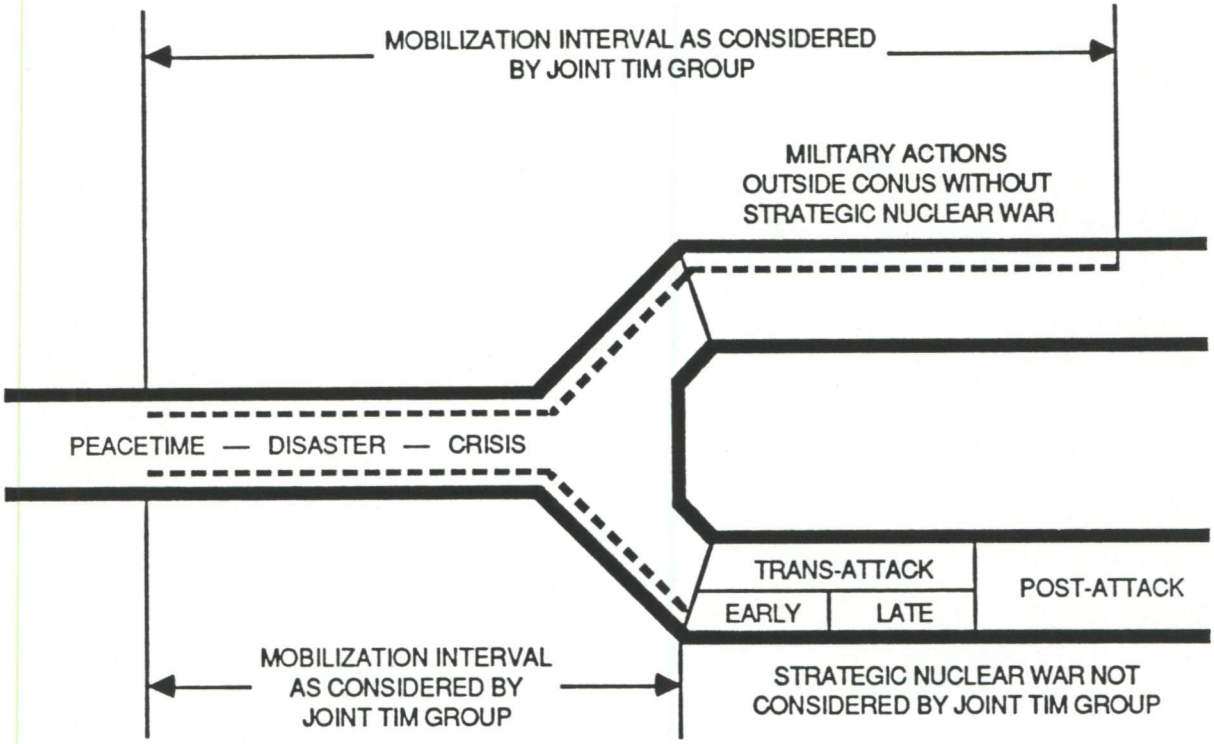

FIGURE 4-1

MOBILIZATION INTERVAL

of Government service requirements must be developed and provided if Industry is to plan and respond effectively. The proprietary interests of participating Industry entities must also be considered and adequately protected.[3]

The Joint TIM Group used the work of the original NSTAC TIM Task Force as the starting point for more detailed analysis of Telecommunications Industry mobilization service surge requirements. However, the Group's overall objectives concerning service surge requirements reflect the provisions of the TIM Implementation Measure in the NCS NSEP Telecommunications Plan of Action (NTPA), calling for:

- The identification of possible impediments to effective telecommunications industry mobilization and mobilization planning and the recommendation of corrective actions and

- The identification and recommendation of any Federal government actions needed to support telecommunications Industry mobilization planning activities.[4]

The Joint TIM Group has approached the subject of telecommunications service surge requirements from two perspectives:

(1) The type and quantity of Federal Government telecommunications service surge requirements under mobilization conditions, and

(2) The estimated capability of Industry to meet Federal Government telecommunications service surge requirements under mobilization conditions.

The Joint Group has been briefed on the ongoing National Security Emergency Preparedness (NSEP) Telecommunications Requirements Analysis being conducted by the Office of the Manager, NCS (OMNCS). The Group has also initiated its own effort to estimate Industry's capacity to meet a mobilization service surge, and has incorporated surge requirements events in the POWER SWEEP '87 and the PROUD SCOUT '88/REX-88 ALPHA exercises. These exercises provided preliminary data specifically targeted at mobilization preparedness.

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[3] Final Report of the TIM Task Force, Volume I p.9.

[4] Implementation Measure 9, "Telecommunications Industry Mobilization," National Security Energy Preparedness (NSEP) Telecommunications Plan of Action, NCS Document No. 208/5, June 27, 1985.

4.3 Findings To Date

The Joint TIM Group has developed preliminary findings in four areas: (1) NSEP telecommunications requirements, (2) Industry surge capability, (3) exercise activities and (4) military mobilization center requirements. Efforts in other related areas are also reported below.

4.3.1 NSEP Telecommunications Requirements Analysis

Executive Order 12472, "Assignment of National Security and Emergency Preparedness Functions," established the basic framework for the NCS NSEP telecommunications activities. The Executive Order provides for the determination by the National Security Council (NSC) and the Directors of the Office of Science and Technology Policy (OSTP) and the Office of Management and Budget (OMB) of what constitutes NSEP telecommunications requirements. It also requires the Federal departments and agencies to provide information regarding their NSEP telecommunications requirements to the NCS. To implement the provisions of the Executive Order, the NCS was tasked in July 1984 to prepare a detailed study that identified and placed in priority order the NSEP telecommunications requirements of the Federal Government and that also identified the existing or planned telecommunications systems and initiatives which support those requirements. This effort was intended to provide a basis for identifying NSEP telecommunications deficiencies and for developing a recommended evolutionary NSEP telecommunications architecture to meet the Federal Government's NSEP telecommunications requirements.

The Requirements Analysis is being conducted on a phased basis and began with the collection and analysis of data on requirements in the late trans- and early post-attack time periods. The methodology used for the Analysis, as well as its initial results, were briefed to the Joint TIM Group. The Group was also briefed on the next phase of the Requirements Analysis which addresses the crisis/mobilization time period. The Joint TIM Group reviewed the data collection form used in the initial phase of the analysis to gather requirements information from the NCS member organizations. The Group also reviewed the extended definition of mobilization that the OMNCS developed to gather data from the NCS members on requirements in the crisis/mobilization period:

> Government mobilization, as a part of crisis, is the process of marshalling resources of Federal, State, and local government to carry out the tasks required to manage the transition to a state of readiness for war or other national emergency. It involves bringing to the proper state of readiness, the leadership, policymaking groups, legislative bodies, courts, and the supporting communications, facilities, procedures, and authorities to manage the transition. Government mobilization activates and controls other aspects of mobilization.

This definition was developed by the OMNCS to assist the Government in completing the Requirements Analysis survey form and represents an extension of the definition developed by the NSTAC TIM Task Force. The Joint TIM Group agreed that the definition developed by the OMNCS is consistent with the one adopted by the Group and is more useful for the purpose of the Requirements Analysis. In addition, the Joint Group suggested that specific mobilization time periods be added to the data collection form to permit more precise identification of Federal Government surge requirements.

The NCS Council of Representatives (COR) ultimately adopted the three mobilization time phases described in the Federal Emergency Management Agency (FEMA) Federal Preparedness Circular Number 2 (FPC-2) as the framework for the crisis/mobilization requirements analysis. These phases are (1) normal operations, (2) preparation, and (3) emergency. It was recommended that Phase 1 in FPC-2 (normal operations) be equated with peacetime to provide baseline requirements. The COR also concluded that TIM crisis/mobilization requirements encompass Phase 2 in FPC-2 (preparation) combined with two sections of Phase 3 (emergency), i.e., domestic emergencies and conventional war. The Joint Group believes that the use of these time periods will facilitate both the estimation of Industry response capacity and the planning necessary to ensure effective Industry response.

The data collection form used to gather the requirements data is reproduced in Appendix 4-A. The results of the data collection effort have been assessed by the OMNCS and the NCS Council of Representatives (COR), and are documented in a SECRET report entitled, National Security Emergency Preparedness (NSEP) Telecommunications Requirements, Phase Two (U).

A summary briefing on the results of the Requirements Analysis study was presented to the Joint TIM Group in March 1988. In this briefing, it was learned that the cited classified report was also designated by the OMNCS as a "limited distribution" document. This latter designation was used by the OMNCS at the request of individual member organizations of the NCS who expressed the view that the detailed requirements information contained within the report was sensitive. Accordingly, the results of the Requirements Analysis were presented to the Joint Group in an unclassified and summary form to overcome this obstacle.

In general, it was determined that the overall expected demand for NSEP telecommunications service would increase by a moderate amount in the transition from peacetime to crisis/mobilization. The NCS Requirements Analysis study showed that the number of user line terminations (defined as a current end point at a user location) would increase by approximately 18%, from a level of 24,800 user line terminations in peacetime to a level of 29,000 user line terminations required in crisis/mobilization. The number of circuits (defined as a 3Khz or equivalent voice grade path) would also increase by approximately 21% for the same transition, from a level of approximately 17,000 circuits in peacetime to a level of approximately

20,600 circuits required in the crisis/mobilization period. Further breakdowns were also provided on the expected change in demand for switched service, dedicated voice service, and dedicated data service.

After receiving this data, the Group determined that the information was insufficient for in-depth analyses, and had limited utility value for the Joint TIM Group purposes. More specifically, due to the broad nature of the data provided, it was not possible to make a full and detailed assessment of Industry's ability to meet the specific NSEP Telecommunications service needs of individual NCS member organizations during the transition from peacetime to crisis/mobilization.

Based upon the Joint TIM Group's assessment of this summary data, additional information on service and equipment surge requirements will be sought to supplement the information in the Requirement Analysis, e.g., data gathered from representative military mobilization centers and other key mobilization-related Government installations.

4.3.2 Industry Service Surge Capability

As part of its initial effort to assess the Telecommunications Industry's capability to respond to service surge requirements, the Joint TIM Group identified and reviewed surge capacity studies that had previously been conducted by either Industry or Government. Among the studies identified were the ongoing work in the Defense Switched Network (DSN) Western Hemisphere (WESTHEM) Architecture program and the Industrial Responsiveness Analysis (IRA) conducted, in conjunction with the Operation PORTCALL exercise in 1985, under the aegis of the Department of Defense (DOD) Office of the Assistant Secretary of Defense (Acquisition and Logistics) and the American Defense Preparedness Association (ADPA).

Although the Telecommunications Industry as a whole did not take part in the IRA effort, the results were useful as general background on mobilization and industrial responsiveness. No specific data on telecommunications service surge capacity was found in the IRA study effort. However, the results were also judged to be applicable to the subject of mobilization management structure and other TIM subjects that the Group will be addressing. The DSN WESTHEM Architecture study of projected DSN surge requirements also provided the Group with an example of one methodology for estimating surge requirements.

In an effort to determine the "elasticity" of telecommunications service capacity, i.e., the ability of the Industry to supply additional service in response to increases in service demands, the Joint Group considered the following questions:

- How much additional telecommunications service could be handled (maximum) while maintaining existing service?

- What is the current spare capacity?

- What is the expected growth in capacity?

- How is the ability to handle overload exploited?

The Group's analysis of the "elasticity" of telecommunications service capacity indicates that service capacity within the Telecommunications Industry has been increasing at a dramatic rate since the 1940s. The overall increase in telecommunications service capacity is shown in Figure 4-2 , which plots the number of telephones in the U. S. from 1900 to the present, and in Figure 4-3, which plots the number of long distance calls per year from 1930 to 1980. This sharp increase in telecommunications service capacity contrasts with the relatively moderate rate of increase in population, as shown in Figure 4-4. Federal telephone system usage is also plotted in Figure 4-3. It amounts to approximately five percent of the total and is growing at a slower pace than use of the Public Switched Network (PSN).

The increase in instruments and calls are supported by increased plant mileage as shown in Figure 4-5, which plots the number of circuit miles from 1930 to 1980. Although the number of central offices needed to support the constantly increasing service capacity increased sharply during the 1940s, it peaked in the mid '50s, and has been declining since that time, as shown in Figure 4-6. The numeric reduction is due to central office consolidation because the newer offices have much greater capacity. In rural areas, remote units are replacing individual offices as well. The Industry's central office production capacity, shown in Figure 4-7, increased rapidly from 1980 to 1985, but is projected to remain relatively constant through the early 1990s, largely because of the increased capacity of the newer offices.

The number of personnel in the uniformed services from 1940 to 1980 is shown in Figure 4-8. The tremendous growth during the World War II mobilization period is evident, and the impact on the Telecommunications Industry was heavy in 1940-1945.

To obtain additional information on the Industry's ability to handle surge requirements, the Joint TIM Group toured the C&P Network Management Center in Washington D.C. On this visit, C&P personnel described the network management tools that permit C&P to accommodate significant increases in traffic demand with little noticeable impact upon the user. Other network management controls were identified that could be employed to ensure that critical users get service.

Following the visit to the C&P facility, Industry members of the Joint TIM Group were asked if the facility was representative of what is available nationwide. It was determined that all of the Bell Operating Companies have similar facilities and that this network management philosophy was expanding and taking advantage of new technology. Industry

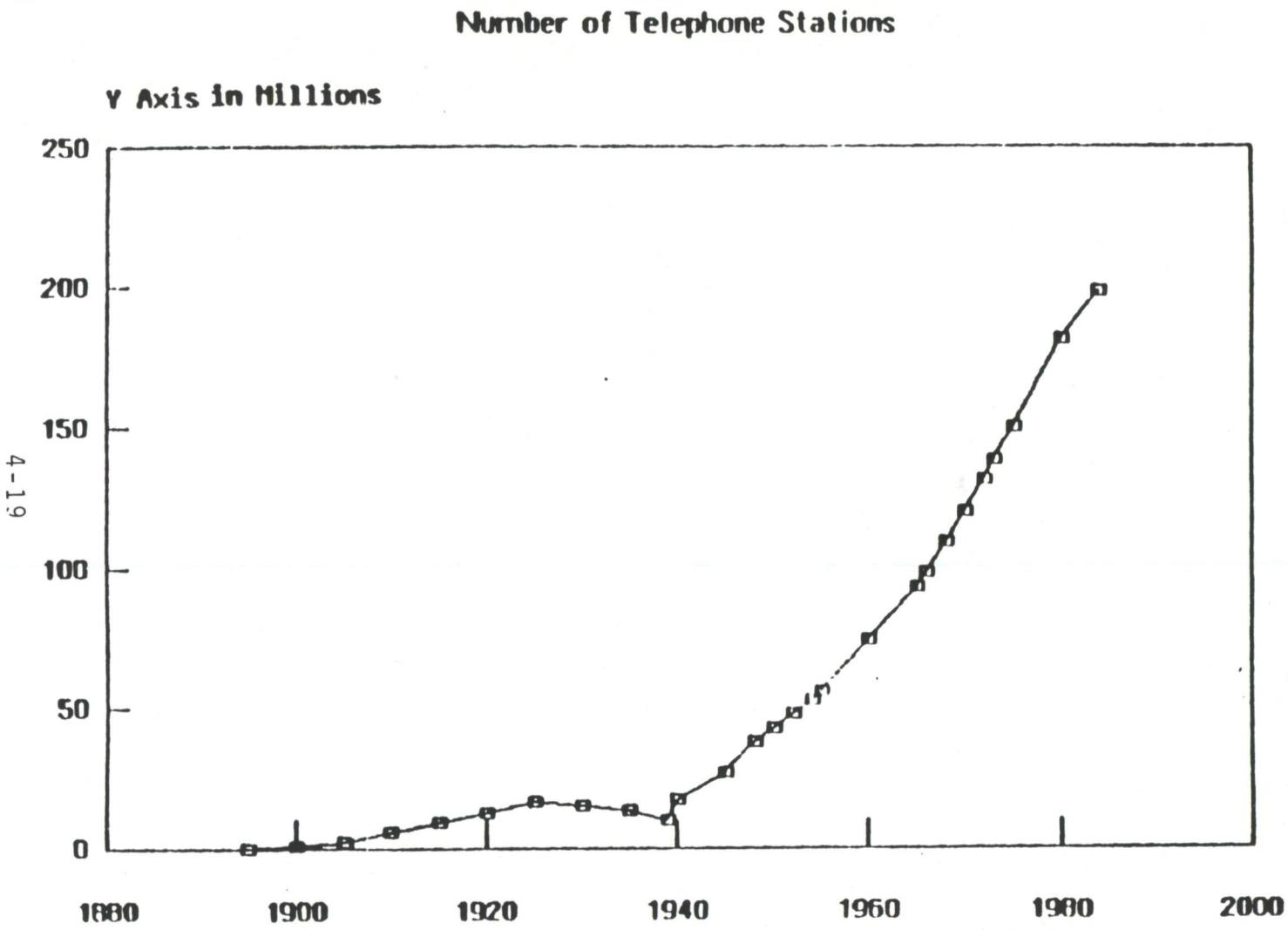

FIGURE 4-2

NUMBER OF TELEPHONE STATIONS

Telecommunications Industry Mobilization

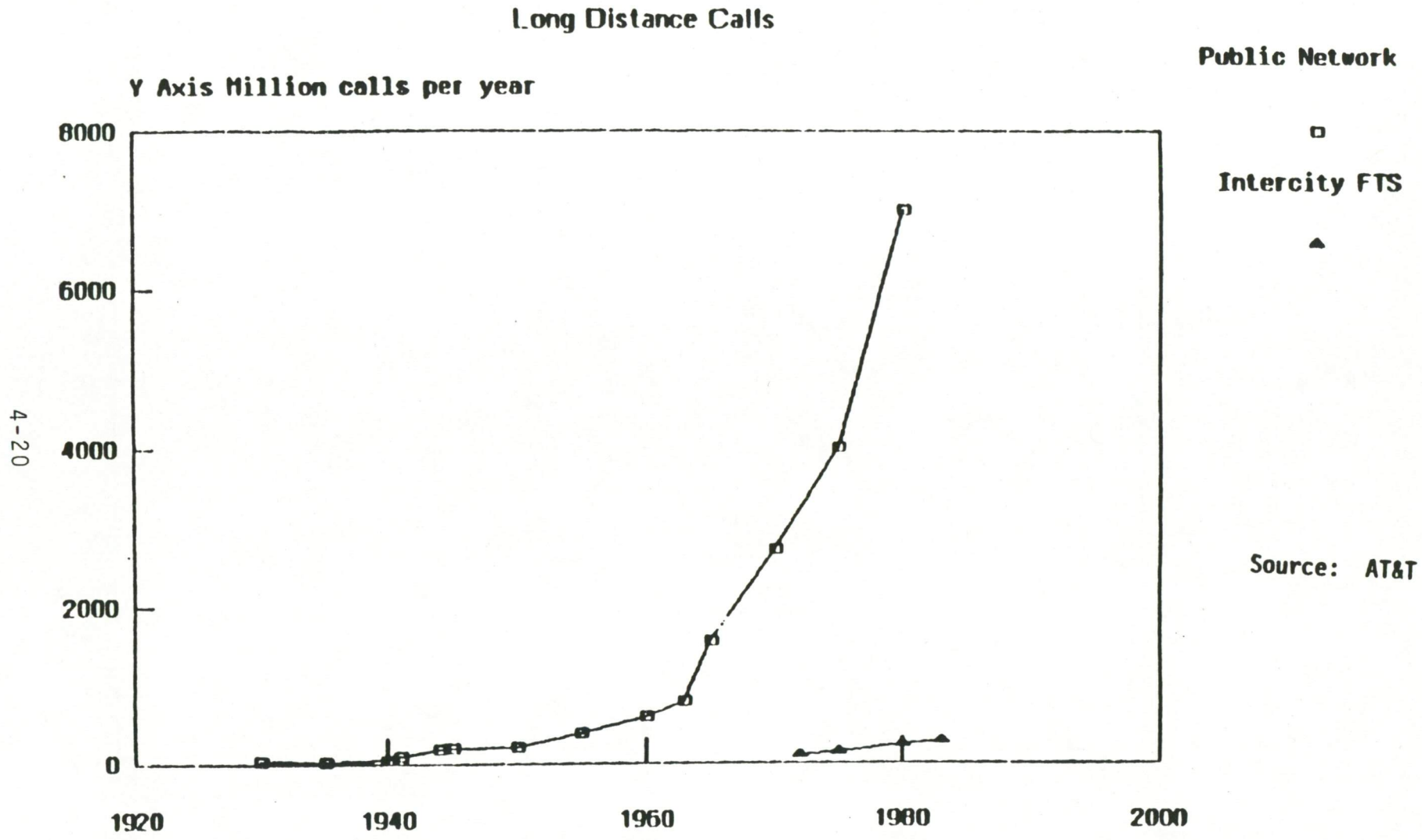

FIGURE 4-3
LONG DISTANCE CALLS

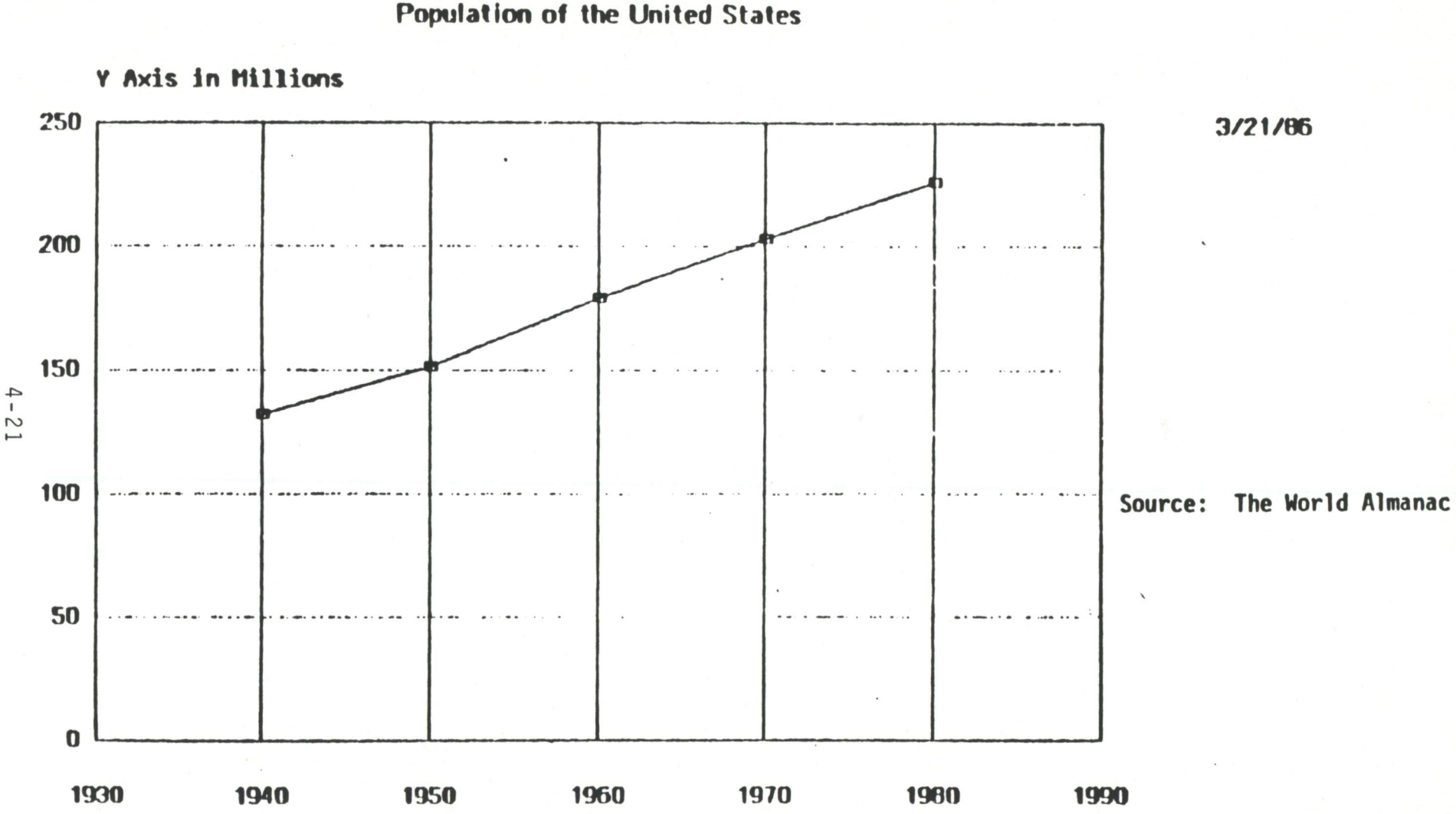

FIGURE 4-4
POPULATION OF THE UNITED STATES

Telecommunications Industry Mobilization

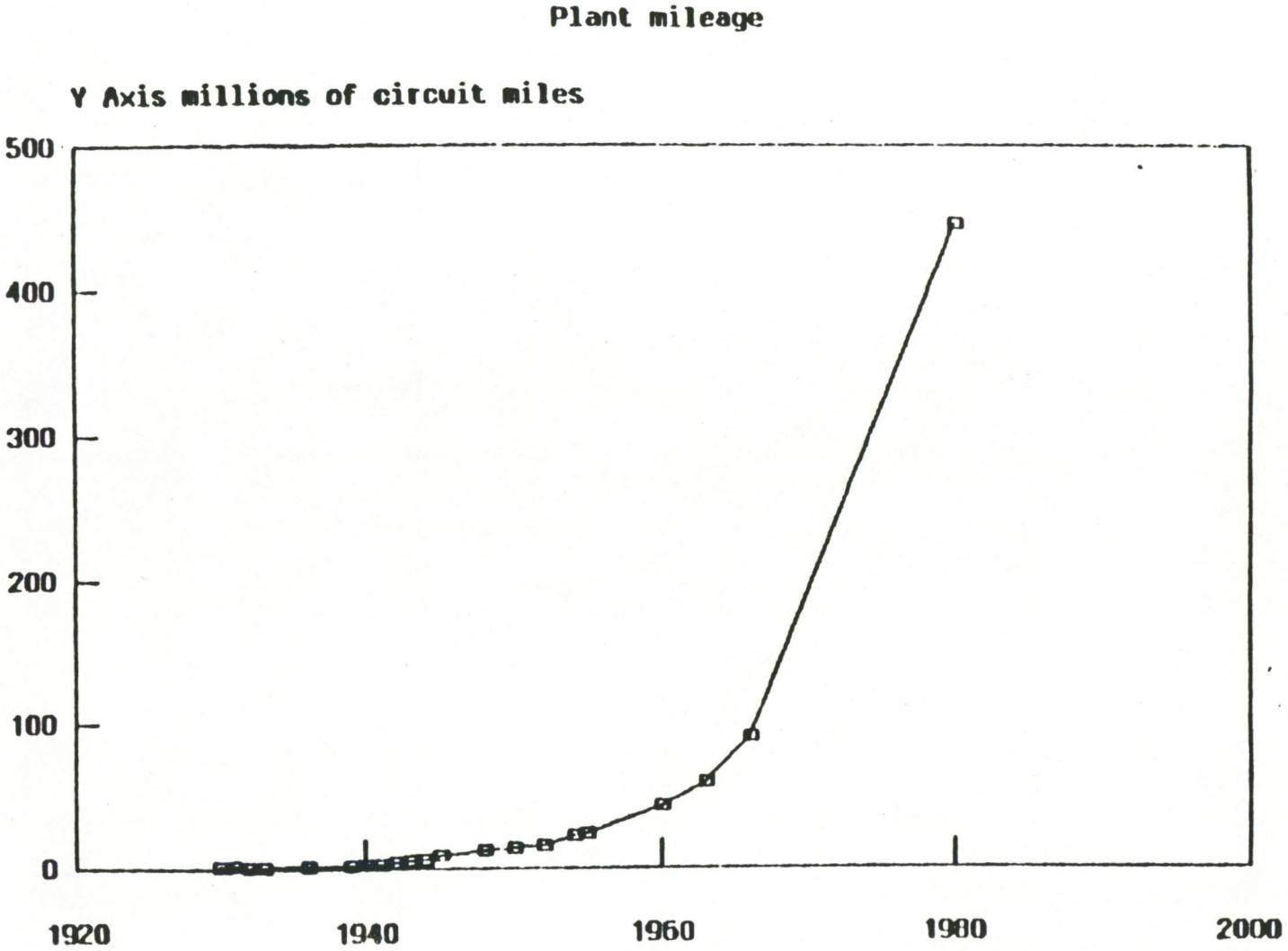

FIGURE 4-5
PLANT MILEAGE

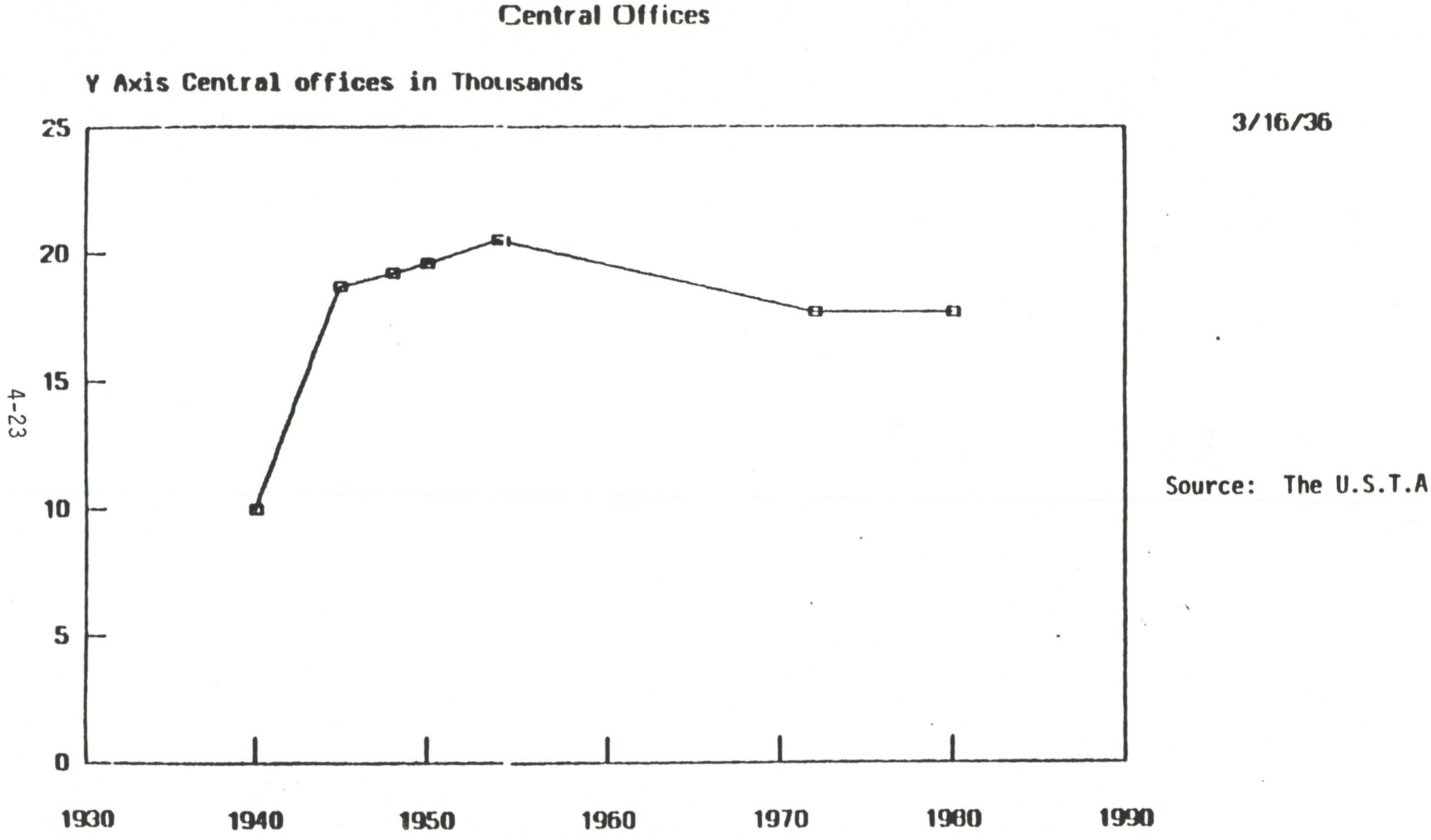

FIGURE 4-6
CENTRAL OFFICES

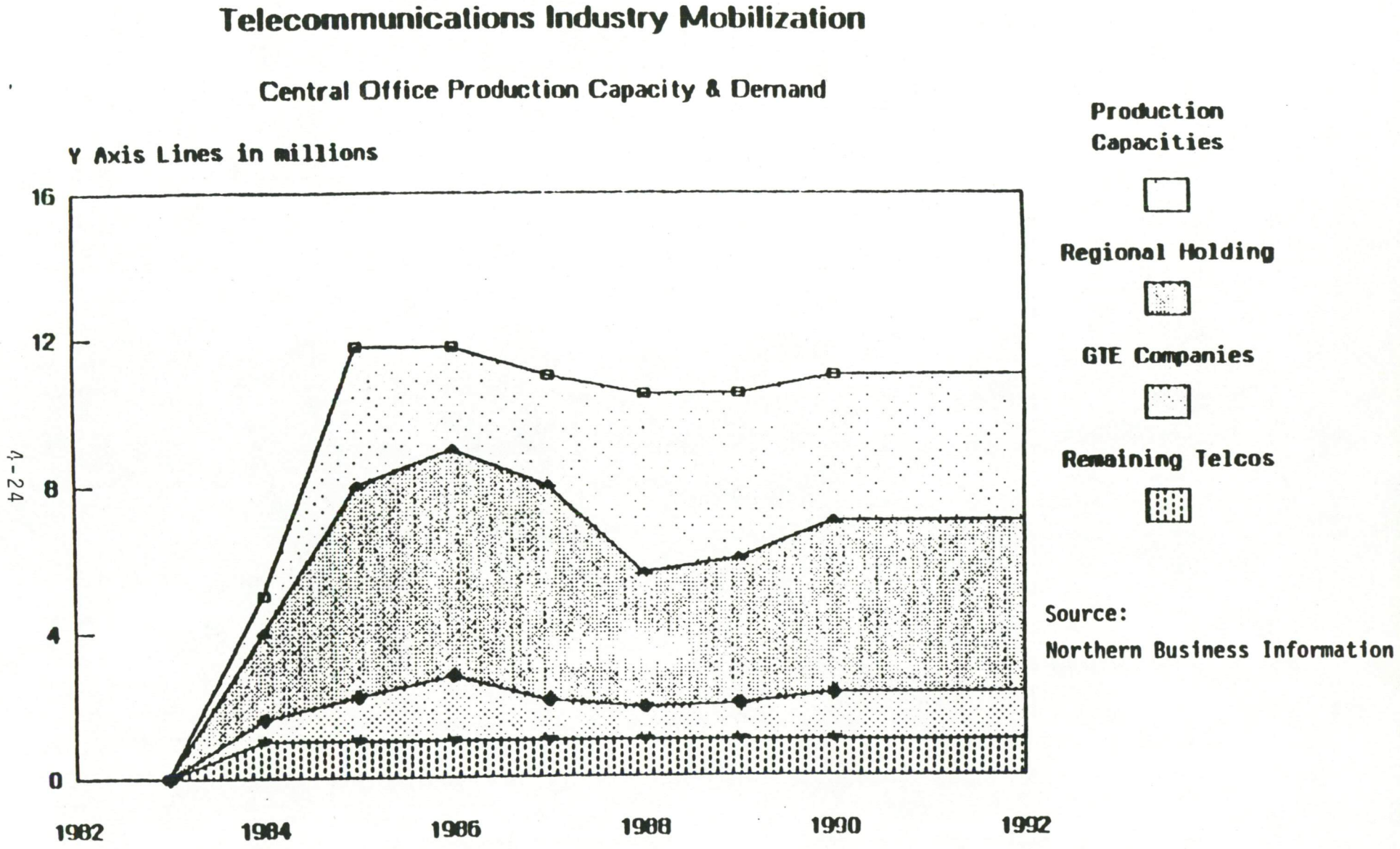

FIGURE 4-7

CENTRAL OFFICE PRODUCTION CAPACITY AND DEMAND

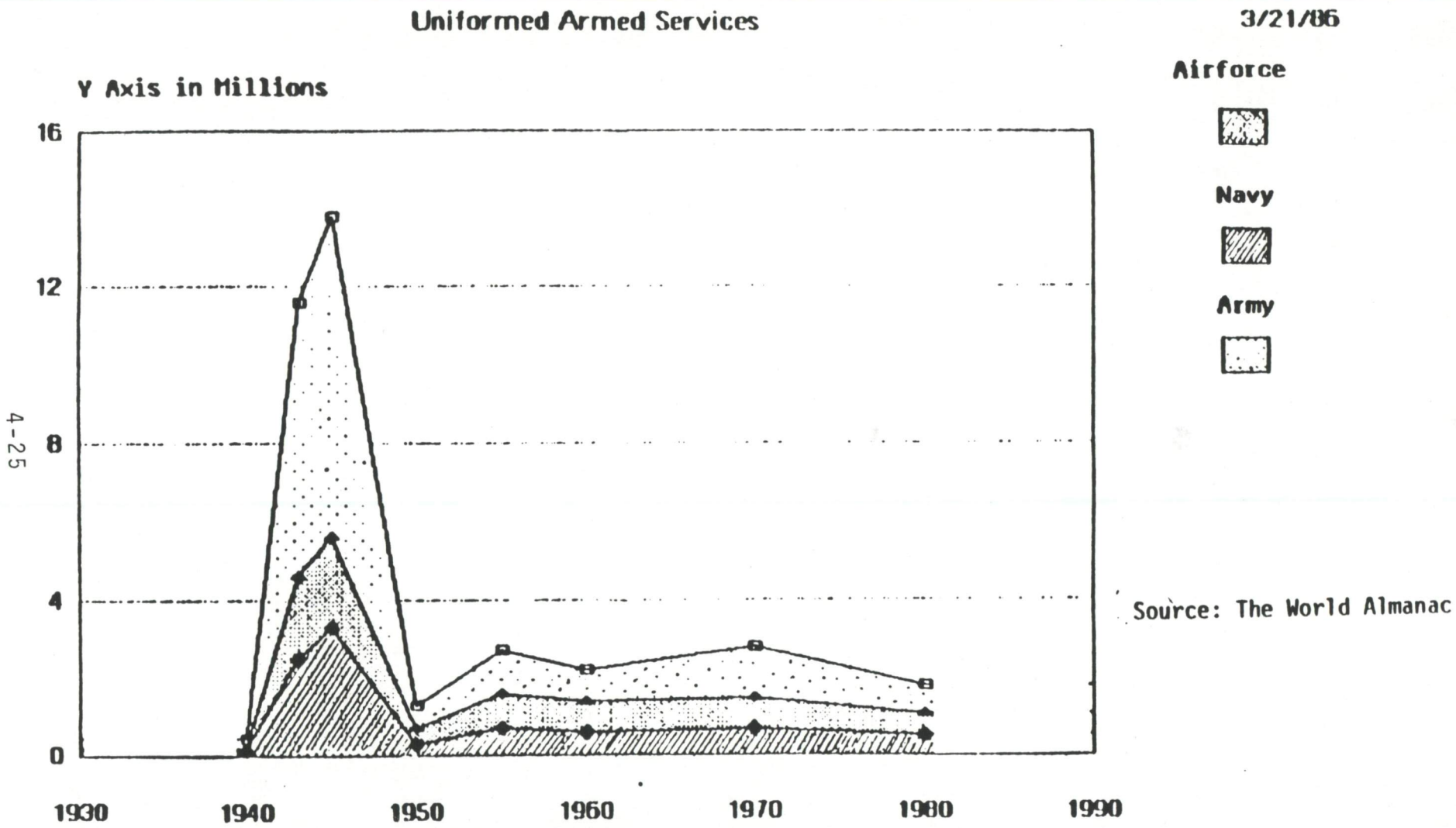

FIGURE 4-8

UNIFORMED PERSONNEL IN ARMED SERVICES

members from other carrier organizations agreed with the TIM Group that this assessment also applied to their companies. A subsequent visit by the TIM Group Chairman to ITT's World Communications Operations Center in New York City further confirmed the Group's belief that necessary Industry network management tools are in place. A visit was also made to Northern Telecom's Canadian Network Management Facility by the TIM Group Vice Chairman to determine if the network management tools applied in U.S. facilities were typically used in Canada. It was determined that this Canadian facility was similar to facilities in the U.S.

4.3.3 Exercise Activities

The Joint TIM Group participated in the POWER SWEEP '87 exercise to obtain preliminary data on the Government's ability to identify its telecommunications service requirements and the Industry's ability to respond. Two specific mobilization events relating to Telecommunications Service Surge Requirements were included in the exercise:

(1) A surge in service demand resulting from the activation of four military mobilization centers, and

(2) A surge in service demand within a geographical area containing many mobilization-critical military and industrial users (i.e., Seattle).

The first of these exercise events involved inactive or semi-active military posts that would be required to accommodate large numbers of activated reserves during a mobilization. Of particular interest was the handling of requirements for military mobilization centers served by an independent telephone company not directly represented in the National Coordinating Center (NCC). The principal focus of this event was the prior identification of mobilization centers' requirements through review of the communications annexes to their mobilization plans and the subsequent testing of procedures for the expedited provisioning of service requirements.

Exercise results indicate that the centers' communications annexes may require updating to reflect changes in the Industry, e.g., divestiture. However, the limited mobilization surge requirements simulated for this exercise were handled by NCC member companies without difficulty. At the time of Power Sweep '87, procedures to contact non-NCC members had not been fully developed, and an ad hoc process had to be used to contact one non-NCC company. This deficiency has subsequently been corrected.

The second exercise event addressed the question of whether telecommunications service providers in a particular area would have sufficient capacity to fill all NSEP telecommunications service requests by the requested service dates or whether further guidance would be needed to determine which requests should be satisfied. The event simulated conflicts between and among the telecommunications service requirements of

military, civil agency, and industrial users, and requests for priority provisioning of these requirements using NSEP Telecommunications Procedures were forwarded to the NCC. Although the majority of service requirements were met, conflicts among users did occur and some service requests were denied by the NCS. Further assessment and testing is required to determine the significance of these service denials and the potential role to be played by the Joint Telecommunications Resources Board (JTRB) in resolving conflicts among military, civil agency, and industrial users.

The Joint TIM Group also participated in the PROUD SCOUT '88/REX-88 ALPHA exercise to gather information on Telecommunications Service Surge Requirements that would substantiate and augment the preliminary findings and conclusions of the earlier TSSR Status Report (September 1987). Three specific mobilization events relating to Telecommunications Service Surge Requirements were included in the exercise:

(1) Examination of Industry's ability to handle a surge in communications traffic caused by increasing the Federal Government's access to the Public Switched Network, through removal of toll access restrictions.

(2) Examination of possible actions which could be taken by the Federal Government to reduce demand on the Public Switched Network during a period of surge demand

(3) Assessment of Government's ability to identify, and Industry's ability to satisfy military mobilization center surge requirements

In assessing the exercise results, the Joint TIM Group agreed that removal of the toll access restrictions would create some congestion of the network between local central office switches and PBXs (i.e., in the local loop), but would have only minimal impact on the long distance portions of the Public Switched Network. Further details of the removal of toll access restrictions would need to be provided in order to determine whether the action required to solve the problem rests with the Federal Government, (i.e., at the PBX) or with Industry, (i.e., at the central office) or requires joint Government-Industry action.

The second exercise issues involved the use of MINIMIZE, a DOD procedure to be used during periods of crisis or other abnormal periods to reduce the volume of record and long distance telephone traffic. The effectiveness of the Government's action to implement MINIMIZE was questioned by NCC Industry participants in the exercise for several reasons. First, in this exercise the request to impose MINIMIZE in the Government was made in the form of a recommendation and not in the form of an order, thereby limiting its effect. Second, MINIMIZE would involve

only Federal Government telecommunications and would not affect the users placing the greatest demand on the PSN, namely the general public and the private sector. Finally, it was noted that by limiting Federal Government communications, MINIMIZE could be a counter-productive procedure constraining required Government mobilization telecommunications.

Overall, the Joint Group concluded that the Federal Government's actions during the exercise to reduce demand on the PSN were limited. Further assessment is required to determine the potential role, if any, that could be played by the Government in setting policies that would help to reduce demand on the PSN during a period of surge.

With regard to the ability of Government and Industry to identify and satisfy military mobilization center surge requirements, the Joint Group concluded that no determination could be made on the degree to which selected U.S. Army mobilization center requirements could be met. This conclusion was based upon the belief that the exercise requirements for this issue were not realistic, and addressed only the type of service required, but not its quantity. The Joint TIM Group members further observed that this problem may be resolved as realistic telecommunications requirements for military mobilization centers emerge from the analysis of the 7th Signal Command questionnaire results. The exercise demonstrated, however, that the seven mobilization centers examined in the exercise, including one center located in a non-NCC member service area, had their generic requirements addressed by the NCC. This exercise also demonstrated that the ad hoc procedures used to contact non-NCC companies in POWERSWEEP '87 had been replaced by more efficient procedures.

Finally, it was observed that limited off-base cable capacity at one mobilization center constrained that center's access to expanded local and long-distance services. These services could have been provided through surplus switch capacity available at surrounding central offices.

Exercise results also suggested that shortages of on-base Customer Premise Wire (CPW), and Customer Premise Equipment (CPE) were also possible under mobilization conditions. These observations of a few mobilization centers may signal a more general limitation of off-base cable, CPW, and CPE at mobilization centers and other facilities with mobilization responsibilities.

4.3.4 Military Mobilization Center Requirements

Following the POWERSWEEP '87 exercise and the PROUD SCOUT '88/REX-88 ALPHA exercise, the Joint Group obtained additional information regarding the service surge requirements of military mobilization centers and other installations that have significant mobilization responsibilities, e.g., ammunition plants, arsenals, medical centers, military ocean terminals, and other specialized army facilities. Upon mobilization, the

telecommunications and other information service requirements[5] of 51 centers and installations (Figure 4-9) would be supported by the U.S. Army's 7th Signal Command. This command would also support the information service requirements of any new installations or facilities that may be activated by the Army due to the mobilization effort.

In a briefing to the Group,[6] mobilization planners from the 7th Signal Command stated that mobilization will result in an overall increase in demand for available information services, with the surge peak probably occurring during the initial critical phase of the mobilization effort.

The following services are considered essential for mobilization support:

- o Administrative Telephone (Telephone switching system, switchboards, user telephone lines/instruments, and normal mix of applicable Automatic Voice Network (AUTOVON), Direct Distance Dialing (DDD), and Wide Area Telecommunications System (WATS) access lines)
- o Automation Systems
  - Data Processing Installation Facility
  - Army Standard Information Management System (ASIMS) Access
  - Office Automation
  - Reserve Component Automation System (RCAS)/Developmental Army Readiness and Mobilization System (DARMS) Access
- o Secure Voice
- o Facsimile (Secure)
- o High Frequency Radio
- o Nontactical Radio Network(s)
- o Worldwide Military Command and Control System (WWMCCS)
- o Defense Data Network Access

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[5]Information services is defined here to encompass automation support (including office automation); telecommunications (including services and transmission media); visual information; records management; and printing and publications.

[6]Information briefing received from representatives of U.S. Army 7th Signal Command, "Overview of Army Information Area Concept and Support Requirements for CONUS Army Installations and Facilities During Mobilization," March 18, 1987.

7TH SIGNAL COMMAND

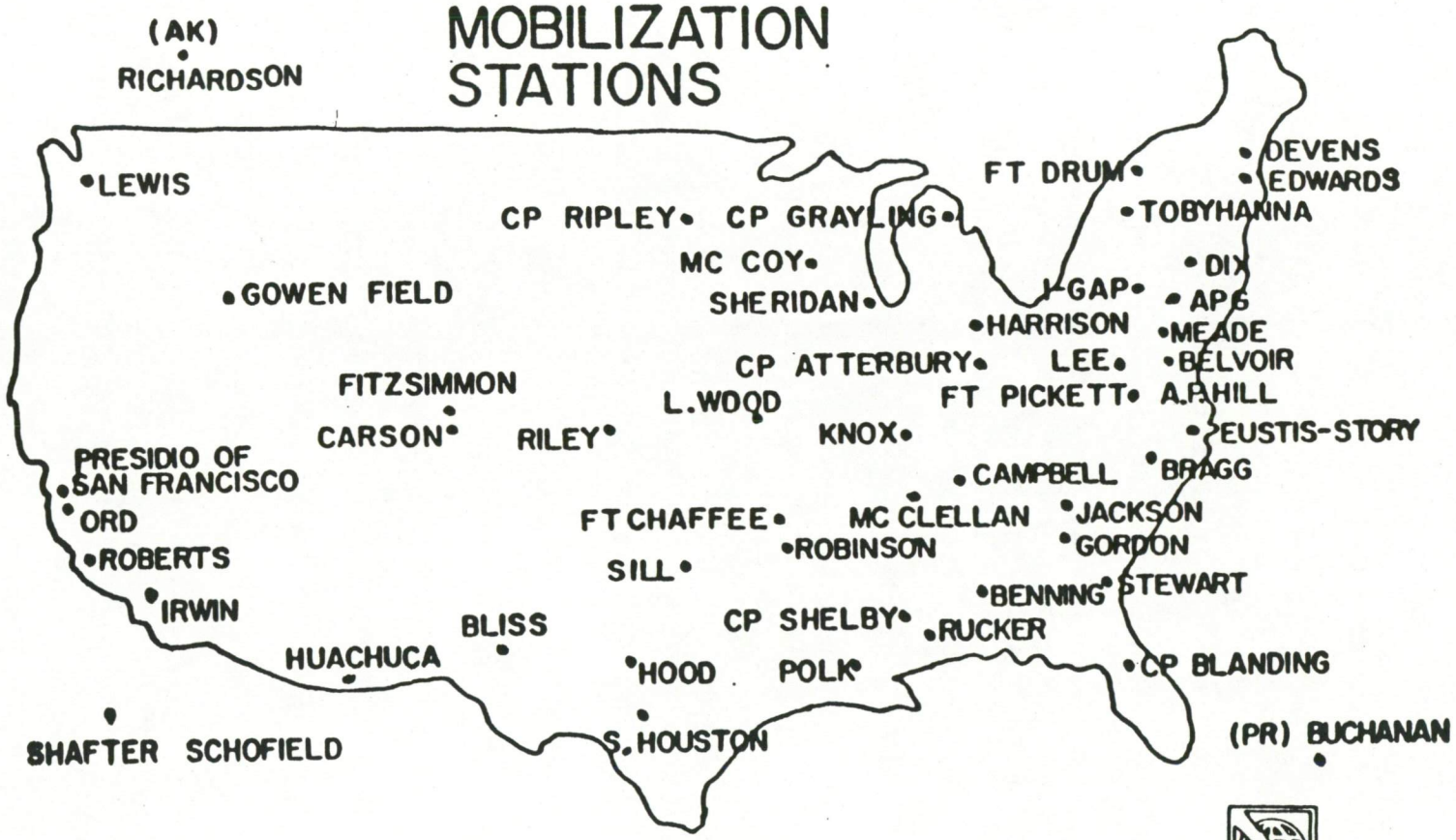

FIGURE 4-9

7TH SIGNAL COMMAND MOBILIZATION STATIONS

Increased traffic volumes at mobilization-related installations and facilities and the activation of new facilities are thus expected to generate the following kinds of surge requirements:

- Additional trunk lines for individual installations or facilities to support increases in switched and dedicated voice and data communications
- Additional hardware necessary to expand trunk and subscriber lines
- Additional automated data processing equipment, including data terminals, at many locations
- Additional telephone instruments
- Additional cable and contractor support for the installation of cable

Other equipment may also be required, including data modems; facsimile; nontactical and high frequency radio; and voice or data security devices. While there are no known requirements for the acquisition of additional telephone switches upon mobilization, additional switches would probably be required during the post-mobilization period.

Equipment downtime must be held to a minimum during mobilization. Accordingly, adequate repair parts must be available, and vendors would be requested to expedite maintenance support response and equipment repair time. In addition, many Army telephone exchanges and automation systems are contractor-operated. The level of contractor support would thus have to be accelerated during mobilization, and some contractors may experience problems due to loss of personnel who have been mobilized.

As previously noted, the communications annexes of the mobilization plans prepared for these centers and installations may not adequately identify and provide for the satisfaction of mobilization surge requirements, particularly if they have not been revised and updated to reflect the results of the divestiture of the Bell Operating Companies from AT&T, and a changed regulatory environment. Quantitative data on anticipated surge requirements of mobilization centers and installations are not currently available, and specific locations or instances where NSEP telecommunications support may be necessary have not been identified.

Accordingly, the Group is currently working with the U.S. Army 7th Signal Command to identify and quantify, by means of a special survey, the service and equipment requirements anticipated by major mobilization centers and installations. The Joint TIM Group will then use this information to assess the ability of telecommunications service and equipment providers to satisfy these mobilization requirements.

4.4.3 Military Mobilization Centers

On the basis of an examination of a select number of the communications annexes to military mobilization centers' mobilization plans, it appears that many or most of these annexes are outdated and/or lack the level of detail needed to obtain new telecommunications services on an expedited basis, i.e., through the use of the NSEP Telecommunications Procedures. Current annexes may, for example, not accurately identify the providers of current services if the annexes have not been updated since the divestiture of the Bell Operating Companies from AT&T.

On the basis of information subsequently obtained from the 7th Signal Command, however, the Joint Group is concerned about the ability of military mobilization centers and installations to gain access to the PSN. This problem must be addressed primarily at the field level in close cooperation with telecommunications service providers, particularly those providing local exchange service. The Joint Group has developed a practical approach for the identification of specific services and equipment required to support a mobilization surge. Once these specific requirements are identified, centers and installations can consult with the appropriate service and equipment vendors, carry out any required procurement actions, or otherwise plan for the satisfaction of identified requirements under mobilization conditions.

Existing Federal Government emergency procurement procedures (i.e., those defined in the Federal Acquisition Regulation (FAR), the Federal Information Resource Management Regulation (FIRMR), and the Defense Priorities and Allocations System (DPAS)[7] can be used to facilitate the emergency acquisition of equipment and wiring. The effective use of these procedures to ensure the end-to-end provisioning of service in a timely manner is, however, dependent on the accurate pre-identification of specific surge requirements by mobilization centers and installations. Where possible, prepositioning of plant may be in order if these procedures are considered too slow to implement.

In developing the approach referred to above, the Group decided to focus on military mobilization center telecommunications service surge requirements. Representatives of U.S. Army 7th Signal Command gave the TIM Group the opportunity of obtaining the desired data through a questionnaire to be distributed by 7th Signal Command to a majority of the military mobilization centers and to other select organizations (CONUS Commercial Port Transportation Units and Army Ammunition Plan locations). Separate arrangements were later made for distribution of the questionnaire to state-owned-and-operated mobilization centers through the National Guard Bureau.

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[7] See Section, 5.0, "Government and Industry Mobilization Management Structure."

To take advantage of this unique offer of assistance, the TIM Group staff worked closely with 7th Signal Command staff to draft and to agree on the questionnaire, as well as to coordinate the project through appropriate chains of command. The Joint TIM Group discussed the approach and questionnaire at several meetings and decided to accept 7th Signal's offer of assistance, even though this meant a final report on TSSR could not be completed by NSTAC IX. At their March 1988 meeting, the TIM Group endorsed the questionnaire and cover memo.

The final schedule calls for submission of questionnaire responses to the 7th Signal Command no later than mid-June 1988. After the data is reviewed and analyzed , it will be incorporated in a final report for NSTAC X.

The questionnaire, as well as the cover memorandum used by the 7th Signal Command for distribution of the questionnaire, has been reproduced in this report as Appendix 4-B.

4.5 Next Steps

The results of the NSEP Telecommunications Requirements Analysis data have been presented to the Joint TIM Group in summary form. It has been concluded that this information, as received, has limited usefulness for Joint TIM Group purposes, and additional data on the Government's service and equipment surge requirements is being sought.

The Joint TIM Group's investigation has highlighted the importance of examining the estimated quantity, nature, and distribution of specific Government requirements. For example, early Joint Group estimates of overall Telecommunications Industry service capacity revealed that the Industry currently has the capacity to accommodate a significant increase in aggregate demand. However, Industry service capabilities are typically concentrated in areas of high sustained service demand while Government mobilization surge requirements, e.g., those associated with the activation of military mobilization centers, may be concentrated in areas where demand is relatively low under normal conditions. Therefore, the Joint Group has implemented an approach for estimating particular Government end-to-end connectivity requirements under mobilization conditions based upon the use of a questionnaire jointly developed with the U.S. Army 7th Signal Command at Ft. Ritchie, Maryland. The responses to the questionnaire will be analyzed by the Joint TIM Group, and used to prepare estimates of the Government's NSEP Telecommunications needs for these major mobilization installations. This statement of Government needs will in turn be used to assess the ability of telecommunications service and equipment providers to satisfy these mobilization requirements.

4.6 Recommendations

The Joint TIM Group has assessed the adequacy of current network management control systems, and has concluded that on an overall basis, these systems can accomodate significant increases in mobilization service demand. The Group has also recognized that Industry is continually investing in the development of advanced technology network management tools to increase network efficiencies in future time frames. However, the Joint TIM Group believes that further in-depth investigations should be conducted in this important area.

An intensive network management study is currently being conducted by the NSTAC's Telecommunications Systems Survivability (TSS) Task Force. The Joint TIM Group recommends that the TSS Task Force be requested to consider the specific impact of mobilization surge requirements in their study of network management control systems, making use of the information developed to date by the Joint Group.

APPENDIX 4-A

NATIONAL SECURITY EMERGENCY PREPAREDNESS (NSEP) TELECOMMUNICATIONS REQUIREMENTS ANALYSIS DATA COLLECTION FORM

NSEP TELECOMMUNICATIONS REQUIREMENTS ANALYSIS WORKSHEET

ORGANIZATION ______________________

DATE ______________

									9 [illegible]			10 DEDICATED SERVICES — A TYPE		B	C DISTANT LOCATION						12 SECURITY					
1 [illegible] TYPE	2 FUNCTIONS PERFORMED	3 LOCATION [illegible]	4 STATE	5 LAT/LONG	6 COMMERCIAL PH. NBR	7 CIRCUIT IDENTIFIER	8 # OF PEOPLE SERVED	FTS	DOD	AVN	OTHER	VOICE	DATA SPEED	# OF CKTS	CITY	STATE	FACILITY	LAT/LONG	COMMERCIAL PH. NBR	11 OTHER SPECIAL SERVICES	C	P	13 REMARKS	PEACETIME	CRISIS MOBILIZATION	WAR/POST ATTACK

APPENDIX 4-B

TELECOMMUNICATIONS INDUSTRY MOBILIZATION (TIM) SUPPORT REQUIREMENTS STUDY

(QUESTIONNAIRE AND COVER MEMORANDUM ISSUED BY U.S. ARMY 7th SIGNAL COMMAND)

DEPARTMENT OF THE ARMY
HEADQUARTERS, 7TH SIGNAL COMMAND
FORT RITCHIE, MARYLAND 21719-5010

REPLY TO
ATTENTION OF

S: 23 May 88

ASN-OP-RM (500-5a)

25 MAR 1988

MEMORANDUM FOR: SEE DISTRIBUTION

SUBJECT: Telecommunications Industry Mobilization (TIM) Support Requirements Study

1. Request action addressees coordinate with subordinate activities for the completion of a Telecommunications Industry Mobilization Support Requirements Study questionnaire (Enclosure 1). A separate questionnaire will be completed by the Director of Information Management (DOIM) Office/USAISC-Activity for each location listed in Survey Locations (Enclosure 2). Request that USAISC-MTMC and USAISC-AMC also provide an estimate of telecommunications industry mobilization support requirements for CONUS commercial ocean port Transportation Terminal Unit (TTU) activities and Army Ammunition Plant (AAP) locations. Questions for commercial ocean port and AAP locations are shown as Enclosure 3. Completed surveys will be submitted through command channels to HQ, 7th Signal Command, ATTN: ASN-OP-RM, Fort Ritchie, MD 21719-5010 not later than 23 May 1988.

2. During mobilization, additional hardware expansion and service support may be required to meet mobilization surge traffic demands. The National Communications System (NCS) requested that the Army determine what demands will be made of the telecommunications industry at mobilization. Adequate information is available which defines existing Information Mission Area support capabilities and mobilization support requirements. However, accurate data has not been compiled from which to determine quantitative hardware and service support requirements. Consequently, this one-time survey must be conducted.

3. The information obtained will be used to complete a final report by the Joint Industry-Government Telecommunications Industry Mobilization (TIM) Group on the subject of telecommunications service surge requirements. For the purposes of this report, the TIM Group has defined mobilization as "the process of marshalling those telecommunications resources needed to make the transition from a normal state to a state of readiness for war or other national emergency."

4. When completing the questionnaire, assume that full mobilization has just occurred and a determination must be made of the telecommunications industry support required during the first 90 days of mobilization. Then, provide a reasonable best estimate response for each question based on consideration of your

ASN-OP-RM
SUBJECT: Telecommunications Industry Mobilization (TIM) Support Requirements Study

installation/facility/activity Information Mission Area support capabilities, mobilization mission, and applicable planning documents (Mobilization, Information Management, and Contingency).

5. The objective of this survey is to determine what demands mobilization will have on the telecommunications industry, and not to document or program mobilization support requirements. This must be accomplished through the Installation Mobilization Plan and Information Management Plan process.

6. In addition to completing the questionnaire, USAISC-Activity Commanders/Directors may wish to include a brief narrative description of their installation's requirements for telecommunications industry support during the first 90 days of mobilization.

7. Generally, the completed questionnaire should not contain classified information and will be marked for Official Use Only (FOUO). If classified information must be included, the completed questionnaire will be marked and protected accordingly.

8. The point of contact for HQ, 7th Signal Command, ASN-OP-RM, is Mr. Ronald D. Belland, AUTOVON 277-5475.

FOR THE COMMANDER:

ASSISTANT DCSOPS

3 Encls
as

WILLIAM F. BRIERLY
Colonel, GS
DCS Operations and Plans

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Cdr, USAISC, ATTN: AS-OPS-OM
Mgr, National Communications System, ATTN: NCS-JS

Telecommunications Industry Mobilization Support
Requirements Study Questionnaire

Administrative Information.

Location:_____

Date Completed:_____

Point of Contact (POC):_____

AUTOVON Number of POC:_____

1.Ø. Telephone Service.

1.1. Is the installation/facility telephone system adequate to support mobilization? Yes ___ No ___. If no check the applicable item below.

1.1.1. ___Inadequate capacity (system expansion possible).

1.1.2. ___Inadequate capacity (system expansion not possible or feasible).

1.1.3. ___Other (Define).
_____
_____
_____
_____

1.2. Upon mobilization will telephone system hardware expansion be required? Yes ___ No ___. If yes check applicable items below and enter quantity required.

1.2.1. ___DDD trunk termination units? Quantity ____.

1.2.2. ___AUTOVON trunk termination units? Quantity ____.

1.2.3. ___Subscriber line termination units? Quantity ____.

1.2.4. ___Equipment bays/racks? Quantity ____.

1.2.5. ___Power supply units? Quantity ____.

1.2.6. ___Other subassembly items (define/list quantity).
_____
_____
_____
_____
_____
_____

Encl

1.2.7. ___Complete telephone switch. Has requirement been identified in Information Management Plan? Yes ___ No ___. List subscriber line and trunk capacity required_____
_____
_____
_____

1.3. Upon mobilization will additional telephone instruments be required? Yes ___ No ___. If yes indicate type and quantity required below.

Quantity	Type required
_____	_____
_____	_____

1.4. Upon mobilization will additional trunk service be required? Yes ___ No ___. If yes check applicable items below and enter quantity required.

1.4.1. ___Commercial DDD trunks. Quantity ____.

1.4.2. ___AUTOVON trunks. Quantity ____.

1.4.3. ___WATS lines. Quantity ____.

1.4.4. ___Other (define/list quantity)._____
_____
_____
_____

1.5. Upon mobilization will additional leased long-haul communications circuits be required? Consider requirements for all additional installation/facility/activity dedicated long-haul communications circuit which will occur upon mobilization. Yes ___ No ___. If yes indicate purpose, type (voice or data and speed (Bits Per Second)), and quantity below.

Purpose	Type	Speed (BPS)	Quantity
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

1.6. Upon mobilization will additional commercial telephone service pay telephones be required for general troop usage? Yes ___ No ___. If yes list quantity ____.

1.7. Will other local telephone company support services be required to support mobilization? Yes ___ No ___. If yes define._____
_____
_____
_____
_____

2.0. Cable Distribution System.

2.1. Is the Installation Cable Distribution System adequate to support mobilization. Yes ___ No ___. If no check the following applicable items:

2.1.1. ___Inadequate cable pairs.

2.1.2. ___Distribution not available for training, staging and/or cantonment areas.

2.1.3. ___Other (define)._____
_____
_____
_____

2.2. Upon mobilization will new or additional access cables be required for training, staging and/or cantonment areas. Yes __ No ___. If yes complete the following.

2.2.1. Define mobilization new or additional access cable requirements by completing the following:

Purpose/identification	Cable pairs	Cable distance (feet)

2.2.2. How will the cable be installed? ___Contractor, ___ Local telephone company, ___Military labor, ___Don't know.

2.3. Is the installation commercial access cable system adequate to support mobilization? Yes ___ No___. If no check the applicable item below.

2.3.1. ___Inadequate cable pairs.

2.3.2. ___Other (define)._____
_____
_____
_____

3.Ø. Secure Voice Service.

3.1. Is available non tactical secure voice equipment adequate to support mobilization? Yes ___ No ___ Not available but required ___ Not available and not required ___.

3.2. If additional secure voice equipment will be required upon mobilization indicate quantity of STUII/III secure voice units required ____.

4.Ø. Facsimile Service.

4.1. Is available secure and/or non secure facsimile machines adequate to support mobilization? Yes ___ No ___ Not available but required ___ Not available and not required ___.

4.2. If additional secure and/or non secure facsimile machines are required upon mobilization indicate quantity required. Secure ____. Non secure ____.

5.Ø. Non Tactical Radio Systems.

5.1. Will mobilization result in a need for additional non tactical radio systems or equipment? Yes ___ No ___ Not applicable ___. If yes check and complete the applicable item below.

5.1.1. ___Additional portable/hand held units. Quantity ____.

5.1.2. ___Additional vehicle mobile units. Quantity ____.

5.1.3. ___Complete system with base station and portable/mobile units. If checked for each system define purpose (fire/police/medical/safety), and quantity data for base station, portable units, and vehicle mobile units._____
_____
_____
_____
_____
_____
_____
_____

5.2. Other Non Tactical Radio service (define). _____
_____
_____
_____
_____

6.Ø Automation.

6.1. Tier III. Will additional tier III computer and associated telecommunications equipment be required upon mobilization? Yes ___ No ___. If yes check the applicable item below and enter the quantity required.

6.1.1. ___Personal computer. Quantity ____.

6.1.2. ___Printer. Quantity ____.

6.1.3. ___Modem. Quantity ____.

6.1.4. ___Software. Quantity ____.

6.1.5. ___Other (define/list quantity) _____
_____
_____
_____
_____

6.2 Tier II. Will additional tier II computer and associated telecommunications equipment be required upon mobilization? Yes ___ No ___ Not applicable ___. If yes check the applicable item below and enter the quantity required.

6.2.1. ___Minicomputer. Quantity ____.

6.2.2. ___Printer (low speed). Quantity ____.

6.2.3. ___Printer (high speed). Quantity ____.

6.2.4. ___Tape drive unit. Quantity ____.

6.2.5. ___Disk drive unit. Quantity ____.

6.2.6. ___Modem. Quantity ____.

6.2.7. ___Software. Quantity ____.

6.2.8. ___Cluster controller ____.

6.2.9. ___Work station (dumb or intelligent terminal) ____.

6.2.10. ___Other (define/list quantity) _____
_____
_____
_____
_____

6.3. Office automation. Will additional office automation equipment be required upon mobilization? Yes ___ No ___ Non applicable ___. If yes, define purpose, type, and quantity (brief description only).

Purpose	Type equipment	Quantity
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

6.4. Telecommunications media access associated with automation. Will additional automation associated telecommunications media (Long-haul communications circuits/Defense Data Network (DDN)) access be required upon mobilization? Yes ___ No ___.

6.4.1. If additional DDN access ports are required is the DDN Node located at the installation? Yes ___ No ___. How many DDN node ports will be required. Define purpose and speed (BPS) of each port.

Purpose	Speed (BPS)
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

6.4.2. If additional dedicated or DDN node access long-haul communications circuits are necessary identify in item 1.5.

7.0. Telecommunications Center (TCC). Define purpose, type, and quantity of any additional TCC equipment which may be required to support mobilization (Brief description only) [place response on next sheet].

Purpose	Type_equipment	Quantity

8.Ø Printing and Publications.

8.1. Define purpose, type, and quantity of any additional printing and publications equipment or services which will be required to support mobilization (Brief description only).

Purpose	Type_equipment	Quantity

9.Ø. Other leased or commercial services.

9.1. Define any other leased or commercial services which may be required to support mobilization and could be requested from the telecommunications industry.

10.0. Contractor services. Will additional contractor support services be required to support mobilization? Yes ___ No ___. If yes provide a brief description of services required. _____
_____
_____
_____
_____
_____
_____
_____

11.0. Personnel.

11.1. Will additional civilian personnel be required by the USAISC-Activity to support the traffic volume surge or extended operational periods due to mobilization? Yes ___ No ___. If yes check applicable item below and enter the number required.

11.1.1. ___Telecommunications Center Operators? Number ____.

11.1.2. ___Switchboard operators? Number ____.

11.1.3. ___Other (define/list number)? _____
_____
_____
_____
_____

12.0. Mobilization Support Planning. Responses to the following questions will not be provided to the TIM Group but will be used for planning purposes at Headquarters, 7th Signal Command.

12.1. Is a copy of the 7th Signal Command Mobilization plan dated May 1987 with the Logistics Annex dated 23 October 1987 available at the USAISC-Activity. Yes ___ No ___.

12.2. What is the date of the most recent Installation Mobilization Plan? _____.

12.3. Has a mobilization TDA been prepared for the USAISC-Activity? Yes ___ No ___ Not required ___.

12.4. Have mobilization civilian personnel requirements been coordinated with the serving Civilian Personnel Office? Yes ___ No ___ Not required ___.

12.5. Have local telephone company service requirements been coordinated with the local telephone company? Yes ___ No ___ Not required ___.

SURVEY LOCATIONS

1. Mobilization Stations.

a. Active and Semiactive.

Aberdeen Proving Ground, MD
Fitzsimmons Army Medical Center, CO
Fort Belvoir, VA
Fort Benning, GA
Fort Bliss, TX
Fort Bragg, NC
Fort Buchanan, PR
Fort Campbell, KY
Fort Carson, CO
Fort Chaffee, AR
Fort Devens, MA
Fort Dix, NJ
Fort Drum, NY
Fort Eustis, VA
Fort Gordon, GA
Fort Benjamin Harrison, IN
Fort A. P. Hill, VA
Fort Hood, TX
Fort San Houston, TX
Fort Huachuca, AZ
Fort Indiantown Gap, PA
Fort Irwin, CA
Fort Jackson, SC
Fort Knox, KY
Fort Lee, VA
Fort Lewis, WA
Fort McClellan, AL
Fort McCoy, WI
Fort Meade, MD
Fort Ord, CA
Fort Pickett, VA
Fort Polk, VA
Fort Richardson, AK
Fort Rucker, Al
Fort Sheridan, Il
Fort Sill, OK
Fort Stewart, GA
Fort Story, VA
Fort Leonard Wood, MO
Presidio of San Francisco, CA

Encl 2

b. State Operated. (Resopnses will be provided by the NGB.)

Camp Atterbury, In
Camp Blanding, FL
Camp Edwards, MA
Camp Grayling, MI
Camp Ripley, MN
Camp Robinson, AR
Camp Roberts, CA
Camp Shelby, MS
Gowen Field, ID

2. Depots/Arsenals

Anniston Army Depot
Corpus Christi Army Depot
Fort Wingate Depot Activity
Letterkenny Army Depot
Lexington Army Depot
Navajo Depot Activity
New Cumberland Army Depot
Picatinny Arsenal
Pine Bluff Arsenal
Pubelo Depot Activity
Red River Army Depot
Redstone Arsenal
Rocky Mountain Arsenal
Sacremento Army Depot
Savanna Depot Activity
Seneca Army Depot
Sierra Army Depot
Tobyhanna Army Depot
Tooele Army Depot
Umatilla Depot Activity
Watervliet Arsenal

3. MTMC Army Ocean Terminal Facilities.

Bayonne Military Ocean Terminal, Bayonne, NJ
Oakland Army Base, Oakland, CA
Sunny Point Military Ocean Terminal, Sunny Point, NC

Supplemental Telecommunications Industry Mobilization Support Requirements Study Questionnaire

Administrative Information.

Location: ___ MTMC commercial ocean port Terminal Transportation Unit (Attach list of locations considered). ___ USAMC Army Ammunition Plant (AAP) (Attach list of locations considered).

Date Completed:_____

Point of Contact (POC):_____

AUTOVON Number of POC:_____

1.Ø. MTMC Commercial Ocean Port Terminal Transportation Unit (TTU) locations.

1.1. For each MTMC commercial ocean port TTU location request USAISC-MTMC provide a consolidated telecommunications industry mobilization support requirements response.

1.2. For each location define possible mobilization requirements for telecommunications industry hardware or service support in the following areas. For each item identify requirement and estimated quantity required.

1.2.1. Local telephone service lines.

1.2.2. AUTOVON access lines.

1.2.3. Dedicated long-haul communications circuits.

1.2.4. Defense Data Network node ports.

1.2.5. Facsimile equipment.

1.2.6. Secure voice set (STU II/III).

1.2.7. Personal computers.

1.2.8. Work station (dumb or intelligent terminal)

1.2.9. Data modems.

1.2.1Ø. Officer copier.

1.2.11. Other (define/list quantity).

Encl 3

2.0. USAMC Army Ammunition Plant.

2.1. For each USAMC Army Ammunition Plant request USAISC-AMC provide a consolidated telecommunications industry mobilization support requirements response.

2.2. For each location define possible mobilization requirements for telecommunications industry hardware or service support in the following areas.

2.2.1. Commercial DDD trunks.

2.2.2. AUTOVON trunks.

2.2.3. Dedicated long-haul communications circuits.

2.2.4. Facsimile equipment.

2.2.5. Secure voice set (STU II/III).

2.2.6. Personal computers.

2.2.7. Data modems.

2.2.8. AUTODIN access for newly activated inactive AAPs (one FAST system for each location).

1.2.8. Other (define/list quantity).

NCS 490/6

5.0 GOVERNMENT AND INDUSTRY MOBILIZATION MANAGEMENT STRUCTURE (FINAL REPORT)

June 1988

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

A defined and integrated management structure is essential for effective telecommunications mobilization planning and response. Government and Industry Mobilization Management Structure was thus identified as one of the first of seven subjects to be addressed by the Joint Government-Industry Telecommunications Industry Mobilization (TIM) Group, which is charged to: (1) identify possible impediments to effective telecommunications industry mobilization and mobilization planning and (2) assist in the development of corrective actions to overcome any identified impediments.

The Group's specific objectives with respect to the mobilization management structure subject were to assess the adequacy and effectiveness of Federal Government and Telecommunications Industry mobilization management capabilities and to offer recommendations for remedial or enhancement measures. To achieve these objectives, the Group sought information from Federal Government and Telecommunications Industry organizations about existing mobilization management plans, programs, and procedures; incorporated mobilization management-related events in TIM exercise play to gain additional insights; and reviewed a paper that describes, from the perspective of the Office of the Manager, NCS, the existing structure for telecommunications mobilization management.

In investigating the concerns identified by the original NSTAC TIM Task Force, the Joint Group gained an appreciation of the complexity of the management structure subject. The detailed findings, conclusions, and recommendations presented in the body of this final report reflect this complexity. While focused primarily on the telecommunications mobilization management arrangements of the Federal Government and the Telecommunications Industry and on the specific mobilization management issues identified by the Group, the findings, conclusions, and recommendations also address the overall Federal Government structure within which telecommunications mobilization management activities must be carried out.

Conclusions

First, the Joint Group has concluded that the fundamental elements necessary for effective telecommunications mobilization management are in place. These include:

- The assignment of national security emergency preparedness (NSEP) telecommunications functions in Executive Order 12472 and the National Coordinating Center (NCC) Operating Charter,

- The Federal Government regulations and procedures that facilitate the emergency provisioning of telecommunications under mobilization conditions,

- The emergency response procedures established by Telecommunications Industry entities, and

- The joint Industry-Government NCC.

However, the Joint Group has also concluded that the ability to fully and effectively use these existing telecommunications mobilization management capabilities is significantly constrained by the absence of both:

- Explicit provisions in NSEP telecommunications management plans and procedures for the performance, coordination, and integration of telecommunications mobilization management functions and activities, and

- A formally defined and documented overall Federal Government structure for mobilization management.

In addition, the Joint Group has concluded that the following specific mobilization management issue areas need to be addressed:

- Regional telecommunications mobilization management

- Coordination of NSEP telecommunications equipment provisioning,

- Broadened Government and Telecommunications Industry involvement in the NCC,

- Coordination between NSEP telecommunications and other key functional areas, and

- Warning and alert procedures.

Recommendations

On the basis of its final assessment of the adequacy and effectiveness of Federal Government and Telecommunications Industry Mobilization Management capabilities, the Joint Group offers the following recommendations:

- The National Security Council (NSC) should, as part of its national security emergency preparedness and response planning effort, ensure the timely definition, documentation, and implementation of an overall Federal Government structure and plan for mobilization management. These documents should:

  - Specify the relationship of the telecommunications mobilization management structure defined in Executive Order 12472 to the overall Federal Government mobilization management structure,

- Identify the mechanisms to be used to integrate Federal Government mobilization management activities across functional/resource areas, and

- Provide for the establishment of regional mobilization management capabilities.

o The National Communications System (NCS) should define, document, and implement a comprehensive approach to and structure for telecommunications mobilization management by incorporating specific provisions for the performance, coordination, and integration of mobilization-related management functions and activities in NSEP telecommunications plans and procedures.

o With respect to the specific telecommunications mobilization management issues identified by the Joint Group, the NCS should:

  - In accordance with guidance provided by the NSC, make explicit provisions for the performance of Federal telecommunications mobilization management functions on a regional basis;

  - Clarify the processes and procedures for coordinating the provisioning of NSEP telecommunications equipment and the resolution of any provisioning conflicts under mobilization conditions, particularly with respect to the role to be played by the NCC;

  - Expand and strengthen NCS member organization representation and participation in the NCC, and broaden Telecommunications Industry NCC participation by involving equipment manufacturers, equipment suppliers, and service integrators on an affiliate basis;

  - Establish procedures for coordinating the mobilization management and response activities of the NCS with those of other key functional/resource areas, e.g., energy and transportation; and

  - Consistent with security considerations, seek to enhance the exchange and dissemination of telecommunications mobilization-related warning and intelligence information.

5.1 Introduction

The Joint Industry-Government Telecommunications Industry Mobilization (TIM) Group was established by the President's National Security Telecommunications Advisory Committee (NSTAC) and the National Communications System (NCS) Committee of Principals (COP) to:

(1) Identify possible impediments to effective telecommunications industry mobilization and mobilization planning, and

(2) Assist in the development of corrective actions to overcome any identified impediments.

A defined and integrated management structure is essential for effective telecommunications mobilization planning and response. Government and Industry Mobilization Management Structure was thus identified by the NSTAC and the NCS COP as one of the first of seven subjects to be addressed by the Joint TIM Group. This report documents the Group's findings, conclusions, and recommendations regarding the Government and Industry telecommunications mobilization management structure.

5.2 Background/Approach

In December 1984, the NCS asked the President's NSTAC to assist the Government in assessing telecommunications industry mobilization and mobilization planning capabilities. In response to the Government's request, the NSTAC charged its Industry Executive Subcommittee (IES) to assist the Government in bringing the issue into sharper focus and to develop recommendations regarding a future role for NSTAC in the area of telecommunications industry mobilization. The IES, in turn, established a Telecommunications Industry Mobilization (TIM) Task Force and instructed it to develop a TIM issue statement.

The NSTAC TIM Task Force defined and clarified the telecommunications industry mobilization issue, identifying seven subjects for further study by industry and government. One of the subjects was Government and Industry Mobilization Management Structure. The mobilization management structure findings of the TIM Task Force were included in a two-volume report[1] and presented for review and approval at the October 9, 1985 meeting of the NSTAC. The NSTAC subsequently charged its IES to assist the NCS in addressing the seven mobilization subjects identified by the task force, including the mobilization management structure subject.

---

[1] Final Report of the Telecommunications Industry Mobilization (TIM) Task Force, Volume I, "TIM Issue Statement," and Volume II, "Background and Supporting Materials," September 1985.

In its final report to the NSTAC, the TIM Task Force summarized its concerns about the existing mobilization management structure as follows:

> Throughout the review of mobilization subjects, the need for a defined and integrated management structure for mobilization was repeatedly articulated. Industry representatives from both the manufacturing and service sectors identified the need for a single authoritative government voice to define needs and establish priorities. Similarly, methods and procedures for transmitting critical government information and requirements, e.g., trigger, notification, and activation procedures, to appropriate points within industry management structures are needed to ensure timely telecommunications industry response. These concerns apply to Section 706 [Communications Act of 1934, as amended] situations as well as non-706 emergencies. It is essential, therefore, that government and industry work together to define and document clear lines of communications and responsibility for proper and timely interaction at all levels of mobilization activity.[2]

The Joint TIM Group has built upon the earlier work of the NSTAC TIM Task Force, conducting its analysis of mobilization subjects within the context of the following definition of mobilization developed by the original NSTAC TIM Task Force:

> The process of marshalling those telecommunications resources needed to make the transition from a normal state to a state of readiness for war or other national emergency.[3]

Mobilization is considered by the Joint TIM Group to encompass peacetime/disaster/crisis through subsequent conventional military actions external to the continental United States, as illustrated in Figure 5-1. The impact of a nuclear attack on the United States has been judged by the Joint Group to be outside the scope of its study. The following mobilization time periods were used by the Group for the purpose of its analyses:

(1) Pre-Mobilization: Planning and Pre-Positioning

(2) Short-Term: 0 to 90 Days (Reallocation and Reprioritization of Existing Capability and Service)

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[2] Final Report of TIM Task Force, Volume I, p. 11.

[3] Final Report of the TIM Task Force, Volume I, "TIM Issue Statement," September 5, 1985, p. 5.

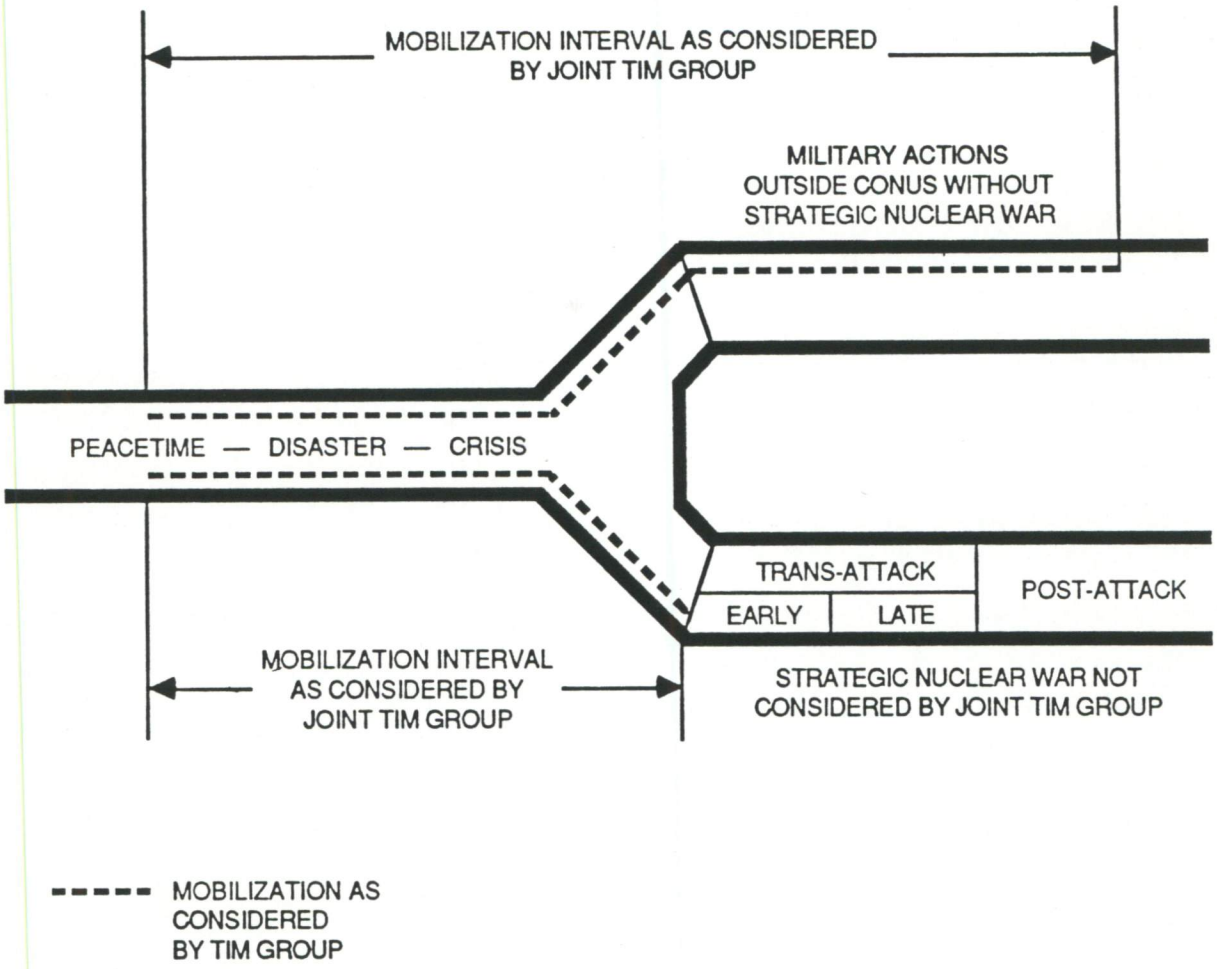

FIGURE 5-1
MOBILIZATION INTERVAL

(3) Mid-Term: 90 to 180 Days (Reallocation and Reprioritization of Products and Services in the Pipeline)

(4) Long-Term: Over 180 Days (Expanded Production of Capacity and Services).

The Group's overall objectives concerning management structure reflect the provisions of the Telecommunications Industry Mobilization Implementation Measure in the NCS's National Security Emergency Preparedness (NSEP) Telecommunications Plan of Action (NTPA), calling for:

- The identification of possible impediments to effective telecommunications industry mobilization and mobilization planning and the recommendation of corrective actions, and

- The identification and recommendation of any Federal government actions needed to support telecommunications industry mobilization planning activities.[4]

The Group's specific objectives with respect to management structure were to assess the adequacy and effectiveness of Federal Government and Telecommunications Industry mobilization management capabilities and to offer recommendations for remedial or enhancement measures.

The Joint TIM Group adopted a two-part approach for gathering information on Government and Industry Mobilization Management Structure. The Group first sought information from Federal Government and Telecommunications Industry organizations about existing mobilization management plans, programs, and procedures, receiving briefings on the following subjects:

- Legal authorities/framework for Federal Government mobilization management,

- Federal Government emergency procurement authorities and procedures,

- The Defense Priorities and Allocations System (DPAS),

- The Department of Defense (DOD) Key Assets Protection Program (KAPP),

- The DOD Joint Industrial Mobilization Planning Process (JIMPP),

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[4]Implementation Measure 9, National Security Emergency Preparedness (NSEP) Telecommunications Plan of Action, NCS Document No. 208/5, June 27, 1985.

- o A proposed Industrial Alert Conditions (INDCON) concept,[5]
- o Industry emergency response plans and procedures, and
- o The status of Federal Government efforts to revise and update its overall national security emergency plans and to develop a Graduated Mobilization Response (GMR) Concept.

The individuals and organizations who provided briefings relating to mobilization management structure are identified in Table 5-1.

In addition to seeking information briefings, the Joint TIM Group also reviewed the results of past exercises that involved industry mobilization, i.e., OPERATION PORTCALL and the Industrial Responsiveness Analysis (IRA) effort conducted by the Department of Defense and the American Defense Preparedness Association (ADPA) in conjunction with OPERATION PORTCALL. This review brought to the Group's attention the potential utility of exercises for gaining insights into the Government and industry mobilization management activities. The Group's interest in incorporating a TIM element in upcoming exercises was subsequently identified in briefings to the NSTAC and the NCS COP. These bodies endorsed this approach to TIM information gathering.

Accordingly, the Joint TIM Group assisted in the definition of a set of objectives and event items for the POWER SWEEP '87 (Fall 1986) and PROUD SCOUT '88/REX-88 ALPHA (Fall 1987) exercises. The Master Scenario Events List (MSEL) items developed to elicit information about mobilization management structure addressed specific areas of concern previously identified by the TIM Task Force as well as specific Government and industry plans and procedures identified in information briefings to the Joint Group. These mobilization management MSEL items related to:

- o The Key Assets Protection Program (KAPP),
- o Emergency procurement responsibilities and processes;
- o Conflict resolution mechanisms and procedures; and
- o Warning, alert, and intelligence dissemination procedures.

MSEL items relating to other TIM subjects, i.e., Telecommunications Service Surge Requirements and Dependence on Foreign Sources, also yielded information relevant to mobilization management.

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[5]This concept subsequently evolved into the Graduated Mobilization Response System concept discussed in section 5.3.2.

TABLE 5-1
INFORMATION BRIEFINGS

SUBJECT	BRIEFER
Legal Authorities/Framework	Mr. J. Randolph MacPherson Office of the Manager, NCS
Emergency Procurement Procedures	Mr. Douglas Phelps General Services Administration
Mobilization Triggers/ Notification Procedures	Mr. Stephen Hood Federal Emergency Management Agency
Industrial Responsiveness Analysis	Mr. Ron Vawter National Defense University
Operation PORTCALL	LTC Jim Olmstead Organization of Joint Chiefs of Staff
Key Assets Protection Program	Mr. Max Alston Department of Defense
Interagency Resource Preparedness Initiatives	Ms. Cher Terry Office of the Manager, NCS
Defense Priorities and Allocations System (DPAS)	Mr. Richard Myers Department of Commerce
Federal Authorities/Plans	Mr. Sean Foohey Federal Emergency Management Agency
Industrial Mobilization Management	Mr. Jim Bean GTE Corporation
Joint Industrial Mobilization Planning Process	LTC Paul C. Gill Organization of Joint Chiefs of Staff
Industrial Alert Conditions and Emergency Preparedness	Mr. John Starnes The Analytic Sciences Corporation
Multiple Award Schedule Contracts	Mr. Les Davison General Services Administration
Graduated Mobilization Response Concept	Mr. Stephen Hood Federal Emergency Management Agency
Emergency Procurement	Mr. Cal Persinger General Services Administration
Section 706 Communications Act of 1934	Mr. Carl Smith Office of the Manager, NCS

The Joint Group's initial findings, conclusions, and recommendations on Government and Industry Mobilization Management Structure were presented in status reports to the NSTAC in May 1986, February 1987, and November 1987, and to the NCS COP in July 1986, March 1987, and December 1987.

Two of the initial conclusions of the Joint Group were that (1) there is a need to develop and distribute an updated description of the overall Federal Government mobilization management structure and (2) more explicit definition of mobilization management functions and activities within the overall NSEP telecommunications management structure is needed to facilitate Government and industry mobilization planning and the training of personnel for mobilization management operations. The Joint Group, accordingly, made the following recommendations in its February 18, 1987 Status Report to the NSTAC and the NCS COP:

(1) The overall Federal Government mobilization management structure is outdated, and ongoing efforts to update that structure should proceed on a priority basis.

(2) To ensure that the Federal Government telecommunications mobilization management structure established by Executive Order 12472 and the NCS is effective, its relationship to the evolving overall Federal Government mobilization management structure needs to be documented and explained within the Federal Government and to the telecommunications industry.[6]

In response to these preliminary recommendations, a paper that describes, from the perspective of the Office of the Manager, NCS (OMNCS), the existing structure for telecommunications mobilization management was developed and provided to the Joint TIM Group[7]. In addition, the OMNCS has provided to the Joint Group information regarding the Federal Government's ongoing efforts to update its national security emergency response plans. This material was used, in conjunction with information briefings and exercise results, to develop the Group's final assessment of the adequacy and effectiveness of the Federal Government and Telecommunications Industry management structure for telecommunications mobilization.

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[6] Government and Industry Mobilization Management Structure (Status Report), February 1987. The complete set of preliminary recommendations offered in the Joint Group's September 1987 status report on Government and Industry Mobilization Management Structure is provided as Appendix 5-B.

[7] The OMNCS "Description of Telecommunications Mobilization Management" is included in this report for reference purposes as Appendix 5-A.

5.3 Findings

The original NSTAC TIM Task Force identified a variety of concerns regarding the Government and Industry mobilization management arrangements, e.g., "trigger, notification, and activation procedures" and "clear lines of communication and responsibility." In investigating these concerns, the Joint Group gained an appreciation of the overall scope and complexity of the mobilization management structure subject. To gain insights into the concerns articulated by the NSTAC TIM Task Force and to understand and assess the status and adequacy of the Government and Industry telecommunications mobilization management structure, the Joint TIM Group found it necessary to examine the general overall Federal Government approach to mobilization planning and management as well as the specific telecommunications mobilization planning and management arrangements of the Federal Government and the Telecommunications Industry. The Group's findings with respect to Government and Industry telecommunications mobilization management capabilities are presented in Section 5.3.1. Its findings regarding the overall Federal Government mobilization management structure are outlined in Section 5.3.2.

5.3.1 Telecommunications Mobilization Management

The Telecommunications Industry and the Federal Government have, through the NSTAC and the NCS, established an overall structure for joint Industry-Government NSEP telecommunications planning and management. However, while mobilization planning and management are encompassed within this overall structure, existing NSEP telecommunications management plans and procedures do not explicitly address mobilization functions and activities. The Joint Group thus sought information about Government and Industry telecommunications mobilization management through (1) review of NSEP telecommunications-related policy, planning, and procedures documents, (2) information briefings by Government and Telecommunications Industry representatives, and (3) participation in military/civil readiness exercises.

In addition, the telecommunications mobilization management structure description (Appendix 5-A) provided by the OMNCS was used by the Joint Group to further its understanding of (1) the respective telecommunications mobilization management roles and responsibilities of the Federal Government and the Telecommunications Industry, and (2) the joint Industry-Government structure for mobilization management. The Joint Group also used the description as one of the bases for identifying mobilization management issues that may warrant further consideration and action by Government and/or the Telecommunications Industry.

The Joint TIM Group's findings regarding Federal Government telecommunications mobilization management, including specific issues pertaining primarily to the Government, are presented in Section 5.3.1.1. Its findings regarding Telecommunications Industry mobilization management

are presented in section 5.3.1.2. Mobilization management issues that are believed to be largely joint in nature are identified and discussed in Section 5.3.1.3.

5.3.1.1 Federal Government. Executive Order 12472, "Assignment of National Security and Emergency Preparedness Telecommunications Functions," sets forth Federal Government functions and responsibilities relating to the planning for and provision of NSEP telecommunications for the Federal Government under all circumstances, including mobilization. This assignment of functions and responsibilities is amplified and further specified in a number of NSEP telecommunications management-related documents, including the following:

- National Coordinating Center (NCC) Operating Charter (1985), NCC Operational Guidelines (1984), and NCC Standard Operating Procedures;
- NSEP Telecommunications Procedures (1987);
- Interim Standard Operating Procedures for the Joint Telecommunications Resources Board (JTRB) (1985); and
- National Plan for Telecommunications Support in Non-Wartime Emergencies (1987).

Summary of NSEP Telecommunications Mobilization-Related Management Functions and Responsibilities

Under Executive Order 12472, NSEP telecommunications management oversight and direction responsibilities are assigned to entities within the Executive Office of the President (EOP), i.e., the National Security Council (NSC) and the Director, Office of Science and Technology Policy (OSTP). The National Communications System (NCS) assists the President, the NSC, and the Director, OSTP, in the performance of their NSEP telecommunications functions and the coordination of the planning for and provision of NSEP telecommunications under all circumstances, including the conditions and time periods defined by the Joint Group as encompassing mobilization (see Figure 5-1 in Section 5.2).

The NSC is assigned overall responsibility for advising and assisting the President in:

- Coordinating the development of policy, plans, programs and standards for the mobilization and use of the Nation's commercial, government, and privately-owned telecommunications resources in order to meet national security or emergency preparedness requirements;
- Providing policy oversight and direction of the activities of the NCS; and

- Providing policy oversight and guidance for the execution of the responsibilities assigned to the Federal departments and agencies.

In addition, the NSC is also assigned responsibility for providing policy direction for the exercise of the President's non-war emergency telecommunications functions and the war power functions of the President under Section 706 of the Communications Act of 1934, as amended. Both sets of functions could be applicable to telecommunications mobilization.

The Director, OSTP, is also assigned responsibilities with direct bearing on telecommunications mobilization management activities, i.e., responsibility for the following:

- Directing the exercise of the war power functions of the President under Section 706, should the President so instruct, and

- Providing information, advice, guidance, and assistance, as appropriate, to the President and to those Federal departments and agencies with responsibilities for the provision, management, or allocation of telecommunications resources, during those crises or emergencies in which the exercise of the President's war power functions is not required or permitted by law.

A Joint Telecommunications Resources Board (JTRB) authorized by Executive Order 12472 and established by the Director, OSTP, assists in the exercise of non-wartime emergency functions. The JTRB is composed of representatives of the Department of Defense, the Department of Commerce, the Federal Emergency Management Agency (FEMA), the General Services Administration, the Federal Communications Commission, and the NCS.

The NCS is responsible for assisting the President, the NSC, and the Director, OSTP, in coordinating the planning for and provision of NSEP telecommunications. To assist in the accomplishment of this mission, the NCS is to serve as a focal point for joint Industry-Government NSEP telecommunications planning and establish a joint Industry-Government NCC that is capable of assisting in the initiation, coordination, restoration, and reconstitution of NSEP telecommunications services or facilities under all conditions of crisis or emergency, including mobilization.

More specifically, the Manager, NCS, is assigned responsibility in Executive Order 12472 for:

- Developing, for consideration by the NCS Committee of Principals and the Executive Agent, NCS, plans and procedures for the management, allocation, and use of Federally owned and leased telecommunications assets under all conditions of crisis or emergency, and

- Implementing and administering any approved plans or programs as assigned, in consultation with the NCS Committee of Principals and the Federal Communications Commission.

In addition, specific NSEP telecommunications responsibilities with mobilization implications are assigned to the following organizations in Executive Order 12472:

- Department of Commerce (DOC)--Crisis or emergency radio spectrum assignments, priorities, and allocations for the Federal Government[8];

- Federal Emergency Management Agency (FEMA)--Telecommunications to support assigned emergency management responsibilities, state and local government advice and assistance, management oversight for the Emergency Broadcast System, and private radio licensee advice and assistance;

- Department of State (DOS) -- Telecommunications for diplomatic activities;

- Department of Defense (DOD) -- Military telecommunications support and telecommunications security and protection;

- Department of Justice (DOJ) -- Legal review of NSEP telecommunications policies, plans, or procedures, as requested;

- Central Intelligence Agency (CIA) -- Telecommunications support for intelligence activities;

- General Services Administration (GSA) -- Federal Government domestic NSEP telecommunications requirements; and

- Federal Communications Commission (FCC) -- Regulatory oversight and assignment of radio frequencies to Commission licensees.

NCC Participation

The joint Industry-Government NCC, which was authorized by Executive Order 12472 and established by the NCS and the NSTAC, assists in the initiation, coordination, restoration, and reconstitution of NSEP telecommunications services or facilities. The NCC Operating Charter defines the respective roles and responsibilities of the Federal

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[8]Although not specifically identified as an NSEP telecommunications function in Executive Order 12472, the Department of Commerce is also responsible for industrial resource priorities and allocations.

for priorities and allocations support, and the DOC has delegated authority for placing priority ratings on contracts and orders to the Government agencies that issue such contracts or orders, e.g., DOD, DOE, FEMA, and GSA. DOC's OIRA has the responsibility for establishing the basic priorities and allocations rules for industrial production and for identifying the authorized programs and agencies in its published regulations.

The use of DPAS is not confined to formally declared emergency situations. It is also used for national defense purposes under peacetime conditions, requiring no declaration of emergency to trigger its provisions. Although its applicability to telecommunications service provisioning is constrained by regulation, it has been used to obtain telecommunications equipment on a priority basis. More detailed information about DPAS is provided in Appendix 5-D.

The use of the DPAS was simulated in the POWER SWEEP '87 exercise in a situation involving competing requirements within DOD for communications equipment produced by a single manufacturer. This situation triggered internal DOD DPAS procedures for resolving conflicts. A Joint Materials Priorities and Allocations Board (JMPAB) composed of representatives of the Organization of the Joint Chiefs of Staff (OJCS) and the military services was convened to consider the competing requirements. The JMPAB determined DOD priorities and satisfactorily resolved the conflict. DPAS procedures for resolving conflicts between DOD and non-DOD entities or among non-DOD entities have not, to the knowledge of the Joint TIM Group, been tested in recent military/civil readiness exercise.

A number of equipment-related events were incorporated in the PROUD SCOUT '88/REX-88 ALPHA exercise as a result of the Joint TIM Group's concern about the management of telecommunications equipment surge requirements. Although caution is necessary in interpreting the limited and inherently artificial results of exercise play, the responses to the surge equipment events indicate that there is some uncertainty and confusion about the role of the OMNCS and the NCC in coordinating NSEP telecommunications equipment provisioning requirements. For example, exercise play indicated that the NCC's automated NSEP telecommunications management tools, i.e., its Emergency Preparedness Management Information System (EPMIS), are designed to handle service, not equipment, requests. In addition, there are no established internal and external procedures for communication and feedback regarding the coordination of equipment provisioning requests. The functions and roles of the NCC as defined in the NCC Operating Charter and amplified in the NCC Operational Guidelines are also unclear on this issue.

Coordination With Other Resource Areas

Reference is made in the OMNCS telecommunications mobilization management structure description to "infrastructure services (transportation and energy)" that "may be required to support the

effective mobilization of telecommunications resources." The description notes that responsibility for the allocation and management of these resources under mobilization conditions rests with specific Federal departments and agencies and private entities. However, no processes or procedures for ensuring adequate consultation and coordination with the responsible Federal departments and agencies and private entities to ensure the maintenance of essential infrastructure support for NSEP telecommunications services were identified.

Since energy and transportation have been identified as functional areas for which interagency functional area groups will be responsible in national security emergencies, the proposed National Security Emergency Plan discussed in Section 5.3.2.2 below may address the issue of consultation and coordination between and among functional areas. The subject of Dependence on Other Infrastructure Elements will also be separately addressed by the Joint TIM Group as one of its remaining mobilization subjects, and the NSTAC's Telecommunications System Survivability (TSS) Task Force and the OMNCS are currently working with the Department of Energy to address NSEP telecommunications requirements. In addition, a transportation priorities issue was identified, addressed, and resolved as a result of recommendations made by the Joint TIM Group in its study of Personnel Issues. Additional insights regarding the requirements and arrangements for coordination with other resource areas may be obtained from the results of trial exercise of the National Telecommunications Management Structure (NTMS) concept.[15]

Internal Federal Government Warning/Alert Procedures

Internal Federal Government procedures for alerting the OMNCS, and thereby the NCC, to changes in military and civil readiness conditions have been tested in recent exercises and found to be effective within the exercise context. For example, the OMNCS was, on several occasions, consulted on whether changes were warranted. However, it is not clear that such alert information is provided to the OMNCS as a standard operating procedure, i.e., outside the context of exercise play.

In addition, it is not clear that internal Government procedures for providing warning and other mobilization-related intelligence information with possible relevance to telecommunications facilities and operations to the OMNCS/NCC have been established. The limited and inherently artificial results from TIM exercise participation suggest that the Federal Government organizations responsible for collecting, analyzing, and transmitting such information may not be aware of the OMNCS/NCC's need

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[15] The proposed NTMS provides for the survivabilty and endurability of NCC capabilities. See National Telecommunications Management Structure Implementation Concept (U), Office of the Manager, NCS.

for intelligence information and its ability to effectively protect and use it. However, the proposed Graduation Mobilization Response (GMR) concept, which is discussed below in Section 5.3.2.2, specifically calls for development of the capability to integrate ambiguous and specific warning with mobilization actions.

5.3.1.2 Telecommunications Industry. The Telecommunications Industry and its constituent companies have not established specific structures, plans, and procedures for mobilization management purposes. However, most telecommunications service and equipment providers have their own established procedures for responding to emergencies and managing their companies' emergency response operations. In addition, major elements of the Telecommunications Industry have actively participated in the establishment and operation of a joint Industry-Government mechanism -- the NCC -- through which responses to NSEP telecommunications requirements can be managed and coordinated under a variety of emergency conditions, including mobilization.

Individual Company Emergency Response Structures, Plans, and Procedures

The telecommunications industry is large and varied, encompassing more than 1000 individual telephone companies[16] as well as an array of manufacturers and suppliers of telecommunications equipment. These industry entities have not established specific structures, plans, and procedures for mobilization purposes per se. However, while it is difficult to generalize with certainty about an entire industry, the industry members of the Joint Group and other knowledgable observers believe that most telecommunications companies have established comprehensive emergency response procedures that would enable them to respond effectively to mobilization requirements. Such procedures are regarded by most telecommunications companies as essential for ensuring continuity of service for their customers. Moreover, telecommunications companies have traditionally recognized the vital nature of the services they provide to the public, as well as to government at all levels, and have responded accordingly.

The information about industry mobilization management structures provided by the Joint TIM Group's industry participants indicates that there is considerable variation across companies in terms of the ways in which emergency responses are managed and the ways in which emergency procedures have been established. For example, as a result of specific provisions in the AT&T Modification of Final Judgement (MFJ) and Plan of Reorganization (POR), the regional Bell companies have established within their jointly-owned Bellcore organization a group responsible for

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[16] Information provided by the United States Telephone Association (USTA).

coordinating NSEP telecommunications activities within their companies. The organization, among other things, serves as a single point of contact for the provisioning of NSEP telecommunications services, e.g., expediting provisioning for mobilization centers located in areas served by the Bell Operating Companies.

Bellcore and the regional Bell companies have also developed, documented, and exercised detailed emergency response plans and procedures and established a formal structure for emergency management. AT&T, which served as the de facto single point of contact for much of the telecommunications industry prior to divestiture, also has an established structure as well as formal plans and procedures. Another long-established service provider - GTE - has made special provisions for the training and deployment of emergency response teams. Other service providers have made less formal arrangements for emergency response and have instead built emergency response capabilities into their normal day-to-day activities and procedures. Non-service providers, e.g., manufacturers, equipment suppliers, and system integrators, have indicated that their existing resource allocation practices and procedures, if carried out at an accelerated rate, would permit them to respond effectively to mobilization requirements.

The assurance that individual telecommunications companies are, in general, well-prepared to respond to emergency situations does not, however, by itself allay the specific concerns expressed by the original TIM Task Force. Methods and procedures for transmitting (and receiving) critical Government information and requirements, e.g., trigger, notification, and activation procedures, to appropriate points within industry management structures were felt to be necessary to ensure timely telecommunications industry response. The establishment of such methods and procedures has been a major focus of activity for industry representatives within the NCC, but only a small proportion of domestic telecommunications companies are so represented. However, these few companies satisfy the preponderance of the Federal Government's telecommunications requirements. Furthermore, the NCC can, in most cases, continue to rely on the major service-providing companies already resident in the NCC to coordinate requests for service involving non-NCC companies.

NCC Participation

Eleven major U.S. telecommunications service providers have resident representatives in the NCC. These resident representatives are available on a daily basis to monitor the status of their systems and networks and to assist, on an ongoing basis, in the development of emergency procedures and contingency plans. In addition, the NCC Charter provides for non-resident participation by Telecommunications Industry entities. Non-resident representatives of Telecommunications Industry entities would serve as NCC points of contact within their respective companies and could

be called upon to perform duties in support of emergency or crisis situations. All U.S. Telecommunications Industry entities that provide domestic or international communications services, local or long-haul communications services, voice or data (including software) communications services, or telecommunications equipment supply services are considered eligible for participation. One service integration company, Martin Marietta Corporation, currently participates in the NCC, along with the United States Telephone Association (USTA), on a non-resident basis.

Arrangements have also been made through the USTA to identify operational points of contact within USTA member companies that are not members of, nor resident in, the NCC. Under contract with USTA, the GTE representative in the NCC maintains a data base of designated points of contact within USTA member companies. As verified in exercise play, this arrangement with USTA and GTE enables the Government to readily identify and contact a large number of non-member and non-resident service providers for NSEP purposes.

Some Telecommunications Industry companies that are not members of the NCC on either a resident or non-resident basis, but that know about the NCC and its operations as result of their participation in the NSTAC believe that their own internal emergency response processes and procedures will enable them to respond effectively to the Government's requirements. They have therefore not sought to become NCC members. If, however, the Government determined that wider industry participation were necessary to meet its requirements, the existing non-resident participation provisions of the NCC Charter would permit ready expansion of NCC Telecommunications Industry capabilities.

Telecommunications Industry Mobilization Management Issue

On the basis of its investigations, the Joint Group has identified, as a mobilization management issue, the question of whether Telecommunications Industry representation and participation in the NCC is adequate to meet overall telecommunications mobilization requirements.

Current Telecommunications Industry representation and participation in the NCC - both resident and non-resident - is oriented primarily around telecommunications service provisioning and restoration. For example, even those companies with associated equipment manufacturing, equipment sales, or service integration capabilities typically provide representation to the NCC from their service operations. As indicated earlier in the Federal Government mobilization management issue section of this report, there may be a surge in telecommunications equipment requirements under mobilization conditions and, therefore, a need for some NCC action to coordinate NSEP telecommunications equipment provisioning. However, exercise results suggest that the information currently available within the NCC may not be sufficient to support an equipment coordination

role, particularly for non-secure customer premise equipment.[17] No defined points of contact or standard procedures for coordinating NSEP equipment provisioning have been formally established with telecommunications equipment suppliers or integrators.[18]

To increase the overall coordination capabilities of the NCC, it may be desirable to broaden the scope of Telecommunications Industry participation in NCC operations by identifying telecommunications equipment providers and integrators, and establishing specific NSEP points of contact and response procedures within participating companies. Such participation need not involve actual membership in the NCC; rather, participating companies could be designated NCC "affiliate" or "associate" companies and perhaps participate in occasional exercises.

5.3.1.3. Joint Industry-Government Telecommunications Mobilization Management Issues. On the basis of its investigations, the Joint TIM Group has identified two joint government-industry mobilization management issue areas:

- o Warning/alert procedures, and
- o Key Telecommunications Industry assets.

Warning/Alert Procedures

The original TIM Task Force identified "trigger, notification, and activation" procedures as a key area of concern within the mobilization management structure subject. The Joint TIM Group shared this concern and studied these kinds of procedures through the design and play of warning, alert, and intelligence dissemination events in military and civil readiness exercises. The objective of these exercise events was to determine if Government and Industry have established reliable procedures for the mutual exchange of critical information.

Exercise play constituted only a limited and artificial test of Government and Industry notification procedures. However, assessment of the exercise results indicated that the major Telecommunications Industry service providers have established procedures for notifying responsible officials within their own companies and relevant government officials of significant service disruptions. These procedures worked well during the exercise, although it is not clear whether events that did not result in

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[17] Exercise results indicate that the Federal Government is able to satisfy its own needs for secure telecommunications equipment such as secure telephones and facsimiles.

[18] Except in the case of mobile/transportable equipment used for service restoration.

significant service outages, would have been reported. Also, in some cases, Government alerts to specific company locations were not reported by these companies to the NCC.

The exercise results also indicate that standard Government operating procedures adequately provide for the dissemination of Telecommunications Industry event reports within the Government. Information provided to the NCS by Industry during the exercises was passed on to other affected organizations, e.g., the Defense Communications Agency (DCA), DOD, and FEMA. Information provided to the NCS by other Government organizations and by Industry was also made available to the Industry and Government representatives resident in the NCC.

Although the exchange of information between Industry and Government within the NCC has proven to be excellent, questions have been raised about the exchange of warning and alert information between Government and non-NCC member telecommunications companies. Currently, information exchange procedures have been established only with those Industry entities that are members of the NCC. While broader dissemination of mobilization-related warning and alert information might be desirable, the lack of secure telecommunications and facilities for storing classified information across the Telecommunications Industry as a whole constrains the information dissemination ability of the OMNCS and the NCC.

Key Telecommunications Industry Assets

The subject of key telecommunications industry assets protection was a particular concern of the Joint Group as a result of briefings to the NSTAC at U.S. Readiness Command Headquarters in May 1986. These briefings indicated that no telecommunications industry assets were currently on the DOD Key Assets List (KAL) or included in the DOD Key Assets Protection Program (KAPP), which provides for the identification and potential protection of assets whose loss would halt or unacceptably delay DOD mobilization and deployment efforts. Following that NSTAC meeting, the Joint Group was briefed by the DOD KAPP coordinator and extensively discussed the issues and problems associated with the identification of key telecommunications assets.

DOD has established the following criteria[19] for the selection of Key Assets:

1. Key Assets. Any asset selected for inclusion in the KAL must be:

    a. A Mobilization, Deployment or Supporting Asset whose loss would halt or unacceptably delay DoD mobilization and deployment efforts; or

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[19]DoD Directive 5160.54, December 5, 1986.

b. An Industrial Asset that produces items on the Commander In Chiefs' Surge Critical Items List, or a similar list of critical items prepared by a DoD component, and whose loss would halt or unacceptably delay DoD mobilization and deployment or sustainment efforts.

2. Categories of Importance. Key Assets, when listed on the KAL, shall be assigned to one of the following categories:

a. Category One. An Industrial Asset, or a Mobilization, Deployment or Supporting Asset, for which there is no replacement, substitute, or alternative. Partial or complete loss would have an immediate and serious impact on the national defense.

b. Category Two. Alternative assets are available but all assets are required for contribution to national emergency needs.

c. Category Three. All Key Assets not in Categories One and Two.

The issues and problems associated with the identification of key telecommunications assets included: (1) industry concerns about the protection of proprietary information and (2) Group concerns about the feasibility of singling out specific assets given the scale and complexity of the national telecommunications infrastructure. The Group therefore decided that a preliminary study should be conducted to determine the feasibility of identifying candidate key telecommunications assets.

The methodology agreed upon for the study provided, first, for the identification by the Government of (1) a small number (4-6) of Local Access Transport Areas (LATAs) and (2) critical facilities within each of those LATAs. Information about the critical facilities, including location and exchange codes/prefixes, would then be provided to relevant industry entities, i.e., those with assets within the LATAs. The industry participants would then analyze the assets that supported critical facilities to identify potential key assets, using the following criterion:

> A telecommunications asset for which there is no replacement, substitute, or alternative within your company. Partial or complete loss would have immediate and serious impact on the ability to provide your company's products or services.

The results of the industry analyses would then be provided to the NCS for

further evaluation, i.e., the identification of telecommunications assets that should be nominated for inclusion on the DOD Key Assets List (KAL).

With the assistance of the NCS Council of Representatives (COR), five LATAs and critical facilities within those LATAs were subsequently identified for the purpose of the preliminary key assets study. The locations and exchange codes/prefixes of critical facilities within the selected LATAS were then provided by the NCS to the exchange and principal interexchange carrier within those LATAs.

One industry analysis was made available for the use of the Joint Group. This analysis revealed that the number and location of access tandems in the LATA and the number of critical users served by a single central office are major factors to be considered in identifying potential key telecommunications assets. In every LATA studied, multiple critical users were served by the same access tandem (or, in one case, a single access tandem). In addition, these access tandems served as, or were collocated with, the central offices for many of the same and/or other critical users. These access tandem/central office facilities were thus identified as potentially warranting designation as key assets.

On the basis of its study, the Group found that potential key telecommunications assets can be identified by Government and industry, using the methodology employed in the pilot study. Participating industry members have noted, however, that (1) more detailed analyses than those conducted as part of the preliminary study need to be performed and (2) comprehensive analysis of the national telecommunications infrastructure will be labor and time intensive and thus quite costly. The Joint Group is also concerned that a Key Telecommunications Assets List would contain both proprietary information and information with significant national security implications.

The Office of the Manager, NCS (OMNCS), has, in conjunction with the Defense Communications Agency (DCA), solicited additional key asset information and nominations from DOD commands and facilities. The OMNCS is currently integrating and evaluating the information obtained to date from the Telecommunications Industry and the Government with the objective of developing an initial list of candidate assets.

5.3.2 Federal Government Mobilization Management

An overview briefing on the existing Federal Government national security emergency management structure was provided by the Federal Emergency Management Agency (FEMA) to assist the Joint Group in understanding the larger context within which telecommunications mobilization management activities would be conducted. The FEMA briefer indicated that this management structure was defined over twenty years ago and was now significantly outdated, e.g., inconsistent with the current national policy of functional coordination rather than functional

management. A new framework for national security emergency preparedness and response has been established in accordance with National Security Council (NSC) policy guidance, and intensive efforts are currently being made to revise and update the old management structure and its supporting plans and procedures. Pending the completion of this effort, the old structure and the plans and procedures that implement it remain in effect. These are described below in section 5.3.2.1. The proposed new approach to national security emergency preparedness and response is described briefly in section 5.3.2.2.

5.3.2.1. Existing Structure and Plans. In the FEMA briefing, a set of classified plans and the associated classified Presidential emergency action documents that would apply to the conduct of Federal government management activities in different types of national security emergencies were described. This set included:

(1) Federal Emergency Plan D for nuclear war emergencies,

(2) Plan OTD (Other Than D) for general war emergencies,

(3) The Resource Mobilization Plan for limited war, and

(4) The National Plan for Emergency Preparedness.

All of these plans, except Federal Emergency Plan D, are applicable to mobilization within the scope defined by the Joint TIM Group (see Figure 5-1 in Section 5.2). While the details of the plans vary somewhat from situation to situation, the management structure would be essentially the same for all of the types of national security emergencies indicated.

Pre-coordinated documents designed to implement Presidential decisions would be used to establish an Office of Defense Resources (ODR). The ODR would then provide direction for the conduct of emergency management activities, including the management of essential resources like telecommunications. Management activities within specific resource areas, e.g., health, transportation, communications, production/ construction, would be carried out within this overall framework in accordance with classified resource/functional area annexes to the plans. For example, specific telecommunications management plans are outlined in Annex B-11 of the Resource Mobilization Plan.

Since the promulgation of Executive Order 12472, "Assignment of National Security and Emergency Preparedness Telecommunications Functions," in April 1984, the NCS has significantly modified NSEP telecommunications management arrangements and supporting plans and procedures. The telecommunications resource annexes to the older Federal government plans, however, have not yet been updated since those plans are currently being revised. Therefore, at this point, the telecommunications

management structures outlined in the resource annexes are also significantly outdated.

5.3.2.2. Evolving Structure and Plans. In response to NSEP policy guidance provided by the President in 1985[20], an NSC National Mobilization Interagency Group (NMIG) has undertaken the task of developing a new comprehensive framework for national security emergency preparedness planning and response. This task is being carried out in conjunction with other related tasks, e.g., the comprehensive revision of the Executive order that assigns emergency preparedness functions to the Federal departments and agencies. To reinforce the importance of these activities from a national security perspective, the Assistant to the President for National Security Affairs, on September 15, 1987, and again on April 27, 1988, identified the following NSEP priorities in memoranda to the heads of the Federal departments and agencies:

(1) Revision of Executive Order 11490 assigning NSEP responsibilities to departments and agencies

(2) Completion of continuity of government policy implementation and update of standby authority documents

(3) Preparation and issuance of a national security emergency plan.

(4) Development of mobilization programs based on graduated response to early warning

(5) Establishment of Federal-state-industry plans to minimize the impact of energy disruptions

(6) Development of a plan for an industry-wide assessment of the production capabilities of defense and essential civilian sectors.

(7) Revision of Executive Order 10480 assigning Defense Production Act responsibilities to the departments and agencies.

Most, if not all, of these priorities have relevance for mobilization planning and response. However, two of the priority tasks - Number 3 and Number 4 - have particular significance for telecommunications mobilization management.

The proposed national security emergency plan (NSEP Priority Number 3) will establish an overall framework for responses to a range of national security emergencies. Mobilization as defined by the Joint Group would be included in the proposed range of emergency situations. Although

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[20]National Security Decision Directive (NSDD) 188, "Government Coordination for National Security Emergency Preparedness." (U)

not yet completed and promulgated, the proposed plan is expected to replace the four, separate, outdated plans and to establish a coordination structure that is less centralized than that provided for in the old plans.

In the proposed plan, principal responsibility for emergency response activities is assigned to a set of six interagency functional groups, i.e., telecommunications, energy, transportation, human services, economic affairs, and legal/law enforcement. Each interagency functional group would be composed of those Federal departments, agencies, and entities with the principal authorities and responsibilities for that particular functional area. Within the framework of these functional groups, Federal departments and agencies would coordinate functional area emergency response measures and activities. If the emergency warrants, the emergency response activities of one or more groups may be coordinated by a representative of the President.

In response to NSEP Priority Number 4, a Graduated Mobilization Response (GMR) System concept[21] has been developed to enhance the U.S.'s capability to rapidly increase the production of supplies and equipment to support and sustain conventional military forces. This capability, in turn, "supports deterrence and provides the ability for a timely and flexible response to the full range of plausible threats." The GMR System concept calls for interagency coordination to integrate ambiguous and specific warning with mobilization actions that mitigate the impact of, improve responsiveness to, or assist in the recovery from a crisis or national security emergency. Under the GMR concept, mobilization is viewed as "a continuum of progressively increased activity, rather than an "off/on" process activated on 'M-Day'." The concept provides for a defined "menu" of graduated readiness measures for three distinct stages or phases of mobilization activity, i.e., Planning and Preparation, Crisis Management, and National Emergency/War. Response option papers would be developed by Federal departments and agencies in peacetime for collection and integration by the National Security Council.

The proposed GMR System concept is currently being reviewed and coordinated within the Federal Government, and current plans call for its implementation by a DOD instruction and a FEMA preparedness circular.

In addition to the two major mobilization-related initiatives outlined above, the Federal Government is also revising two Executive orders -- Executive Orders 11490 and 10480 -- that provide for the performance of mobilization-related functions. The revision of Executive Order 11490 (NSEP Priority Number 1) will update the assignment of

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[21]Graduated Mobilization Response Concept paper, March 28, 1988.

emergency preparedness functions within the Federal Government.[22] The revision of Executive Order 10480 (NSEP Priority Number 7) will update the assignment of responsibility for the exercise of authorities granted by the Defense Production Act, including the delegation of Title I priority and allocation authority for industrial resources.

5.4 Conclusions

First, the Joint Group has concluded that the fundamental elements necessary for effective telecommunications mobilization management are in place:

- Both Federal Government and Industry telecommunications mobilization management activities can be effectively carried out within the overall framework for NSEP telecommunications management established in Executive Order 12472 and the NCC Operating Charter,

- Current Federal Government regulations and procedures adequately provide for the emergency provisioning of telecommunications services and equipment that might be required under mobilization conditions,

- Most telecommunications companies have established comprehensive emergency response procedures that could enable them to respond effectively to mobilization requirements, and

- The joint Industry-Government NCC provides a unique mechanism for accomplishing the necessary integration of Federal Government and Telecommunications Industry mobilization management activities.

However, the Joint Group has also concluded that the ability to fully and effectively use these existing telecommunications mobilization management capabilities is significantly constrained by the absence of both:

- Explicit provisions in NSEP telecommunications management plans and procedures for the performance, coordination, and integration of telecommunications mobilization management functions and activities, and

- A formally defined and documented overall Federal Government structure for mobilization management.

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[22] Telecommunications are not included in the Order since NSEP telecommunications functions are assigned in Executive Order 12472.

While, in the case of the first constraint, the telecommunications mobilization management structure description provided by the OMNCS represents an initial step in the development of explicit provisions, that description does not represent a coordinated NCS perspective and may not reflect the full range of NSEP telecommunications functions assigned in Executive Order 12472.

Finally, the Joint Group has concluded that the following specific mobilization management issue areas need to be addressed:

- Regional telecommunications mobilization management
- Coordination of NSEP telecommunications equipment provisioning,
- Broadened Government and Telecommunications Industry involvement in the NCC,
- Coordination between NSEP telecommunications and other key functional areas, and
- Warning and alert procedures.

5.6 Recommendations

On the basis of its final assessment of the adequacy and effectiveness of Federal Government and Telecommunications Industry mobilization management capabilities, the Joint Group makes the following recommendations:

- The National Security Council (NSC) should, as part of its national security emergency preparedness and response planning effort, ensure the timely definition, documentation, and implementation of an overall Federal Government structure and plan for mobilization management. These documents should:
  - Specify the relationship of the telecommunications mobilization management structure defined in Executive Order 12472 to the overall Federal Government mobilization management structure,
  - Identify the mechanisms to be used to integrate mobilization management activities across functional/resource areas, and
  - Provide for the establishment of regional mobilization management capabilities.
- The National Communications System (NCS) should define, document, and implement a comprehensive approach to and structure for telecommunications mobilization management by incorporating

specific provisions for the performance, coordination, and integration of mobilization-related management functions and activities in NSEP telecommunications plans and procedures.

- o With respect to the specific telecommunications mobilization management issues identified by the Joint Group, the NCS should:

  - In accordance with guidance provided by the NSC, make explicit provisions for the performance of Federal telecommunications mobilization management functions on a regional basis;

  - Clarify the processes and procedures for coordinating the provisioning of NSEP telecommunications equipment and the resolution of any provisioning conflicts under mobilization conditions, particularly with respect to the role to be played by the NCC;

  - Expand and strengthen NCS member organization representation and participation in the NCC, and broaden Telecommunications Industry NCC participation by involving equipment manufacturers, equipment suppliers, and service integrators on an affiliate basis;

  - Establish procedures for coordinating the mobilization management and response activities of the NCS with those of other key functional/resource areas, e.g., energy and transportation; and

  - Consistent with security considerations, seek to enhance the exchange and dissemination of telecommunications mobilization-related warning and intelligence information.

APPENDIX 5-A

OMNCS DESCRIPTION OF TELECOMMUNICATIONS MOBILIZATION MANAGEMENT STRUCTURE

NATIONAL COMMUNICATIONS SYSTEM
OFFICE OF THE MANAGER
WASHINGTON, D.C. 20305 - 2010

IN REPLY
REFER TO: NCS-JS

JUN 17 1988

MEMORANDUM FOR DISTRIBUTION

SUBJECT: "Description of Telecommunications Mobilization Management Structure"

1. The subject document is enclosed for your information and use.

2. This description of the telecommunications mobilization management structure has been developed by the Office of the Manager, National Communications System (OMNCS), for use by the Joint Industry-Government Telecommunications Industry Mobilization Group in investigating the Government and Industry Mobilization Management Structure, one of the seven mobilization subjects being considered by the Group. The description is based on material extracted from existing documents, e.g., Executive Order 12472, "Assignment of National Security and Emergency Preparedness Telecommunications Functions," the National Coordinating Center Operation Charter and Operational Guidelines, and National Coordinating Center Standard Operating Procedures, and, as such, should be considered an accurate characterization of telecommunications mobilization management as described in these plans and procedures.

1 Enclosure a/s

B. E. MORRISS
Deputy Manager

DISTRIBUTION:
Mr. Carl Smith, NCS-A
COL Charles L. Gordon, NCS-AD
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DESCRIPTION OF

TELECOMMUNICATIONS MOBILIZATION MANAGEMENT

STRUCTURE

OFFICE OF THE MANAGER
NATIONAL COMMUNICATIONS SYSTEM

JUNE 1988

PREFACE

This description of the telecommunications mobilization management structure has been developed by the Office of the Manager, NCS (OMNCS), for use by the Joint Industry-Government Telecommunications Industry Mobilization (TIM) Group in investigating the Government and Industry Mobilization Management Structure, one of the seven mobilization subjects being considered by the Group. The description is based on material extracted from existing documents, e.g., Executive Order 12472, the NCC Operating Charter and Operational Guidelines, and NCC Standard Operating Procedures.

TABLE OF CONTENTS

LIST OF FIGURES

1.0 INTRODUCTION

Telecommunications mobilization and mobilization-related functions, responsibilities, processes, and procedures are defined and discussed in a number of NSEP telecommunications source documents. The overall framework for NSEP telecommunications management, including mobilization management, is defined in Executive Order 12472. The mobilization functions and responsibilities of the OMNCS are outlined in the NCS element of the Department of Defense (DOD) Master Mobilization Plan (MMP). The NSEP telecommunications functions and responsibilities of the NCC--including those of Industry and Government representatives; the Manager, NCC; and his staff--are defined in the NCC Operating Charter, Operational Guidelines, and associated Standard Operating Procedures. The responsibilities of the JTRB are described in the JTRB Interim Standard Operating Procedures. Procedures for expediting the emergency provisioning of NSEP telecommunications services are outlined in the NSEP Telecommunications Procedures Manual. Information extracted from these source documents has been used below to develop the following descriptions of the telecommunications mobilization management concept, structure, and activities.

2.0 TELECOMMUNICATIONS MOBILIZATION MANAGEMENT CONCEPT

Telecommunications mobilization is the process of marshalling those telecommunications resources necessary to make the transition from a normal state to a state of readiness for war or other national emergency.[1] The goal of such a mobilization effort is, more specifically, to ensure that telecommunications resources are available to support the national emergency response efforts of the Federal Government, including any call-up and deployment of military forces and the emergency production and distribution of required goods and services. Under mobilization conditions, the Federal Government is the principal source of authoritative guidance regarding national telecommunications priorities and requirements while the Telecommunications Industry is the principal source of the assets and expertise needed to support those requirements and priorities. The process of marshalling telecommunications resources thus requires close cooperation between, and concerted action on the part of, the Federal Government and the Telecommunications Industry.

The mobilization management activities of the Federal Government and the Telecommunications Industry are carried out within the overall framework established by Executive Order 12472, "Assignment of National Security and Emergency Preparedness Telecommunications Functions." This framework encompasses three generic operating environments that reflect the specific national security emergency preparedness (NSEP) telecommunications authorities and responsibilities of the President: day-to-day, non-wartime emergencies, and war emergencies. Mobilization, as a process of working toward a state of readiness for war or other national emergency, is most likely to take place in a non-wartime emergency operating environment. However, mobilization must be prepared for in the day-to-day environment and could take place, or continue into, a war emergency environment.[2]

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[1] This definition was developed and adopted by the Joint Industry-Government Telecommunications Industry Mobilization (TIM) Group, and subsquently used, in modified form, by the Office of the Manager, NCS (OMNCS) in gathering NSEP telecommunications requirements for the crisis/mobilization period.

[2] This characterization of the operating environment for mobilization is consistent with the emergency phases outlined in Federal Preparedness Circular 2 (FPC-2), in which peacetime is defined as the "Normal Operations Phase", and crisis[/mobilization] is defined as including the "Preparation Phase" and the "Emergency Phase" up to nuclear war, (i.e., domestic and conventional war portions of Emergency). From Appendix A of National Security Emergency Preparedness (NSEP) Telecommunications Requirements Phase Two (U).

In the day-to-day operating environment, Federal Government and Telecommunications Industry mobilization management activities are directed toward mobilization planning and preparedness. These planning and preparedness activities include the establishment and exercise of procedures and processes for responding to surge requirements and for coordinating Government and Industry response activities.

In the non-wartime emergency operating environment, Federal Government and Telecommunications Industry mobilization management activities are focused on the timely exchange of essential information and effective joint Government and Industry coordination of responses to telecommunications surge requirements on a nationwide basis. Providers and users of telecommunications resources will seek to satisfy mobilization needs through normal procurement processes and practices, using emergency provisioning processes only as necessary to expedite fulfillment of mobilization-related requirements. However, to facilitate effective response to national mobilization needs, the Federal Government will provide authoritative national level policy guidance, ensure that telecommunications mobilization activities are consistent with and mutually supportive of mobilization activities in other functional areas, and establish mechanisms for the authoritative resolution of resource and response issues.

It is anticipated that close consultation and coordination between Government and Industry at all levels can assure effective telecommunications mobilization response under all but the most extreme circumstances, i.e., attack or war upon the United States. However, the President may find it necessary to use some or all of the war emergency powers available under the Communications Act of 1934, as amended, to meet national mobilization requirements.

The management structure, processes, and procedures developed for NSEP telecommunications purposes are designed for flexible use in a range of crises or emergencies, including mobilization, and across operating environments. They include: the Joint Telecommunications Resources Board (JTRB), the National Coordinating Center (NCC), the NSEP Telecommunications Procedures, the proposed Telecommunications Service Priority (TSP) System, automated management information systems, and the National Telecommunications Management Structure (NTMS). The application of these management "tools" to mobilization management is discussed in more detail in Sections 2 and 3.

3.0 TELECOMMUNICATIONS MOBILIZATION MANAGEMENT STRUCTURE

Overall policy direction and guidance for the mobilization and use of telecommunications resources is provided by the President and the National Security Council. The mobilization activities of the various Federal departments and agencies, including telecommunications mobilization activities, are coordinated through a structure of interagency functional groups, e.g., telecommunications, energy, transportation, human services, economic affairs, and legal/law enforcement.[3]

The key elements of the telecommunications mobilization management structure are:

- The President and the National Security Council (NSC)
- The Director of the Office of Science and Technology Policy (OSTP) and the Joint Telecommunications Resources Board (JTRB)
- The Manager, NCS, and the National Coordinating Center (NCC)
- Telecommunications Resource Providers and Users.

The overall management structure for telecommunications mobilization is shown in Figure 1.

3.1 The President and the NSC

Under Executive Order 12472, the NSC advises and assists the President in coordinating the development of policy, plans, programs, and standards for the mobilization and use of the Nation's commercial, Government, and privately-owned telecommunications resources in order to meet NSEP requirements. The NSC provides advice and assistance to the President during those crises or emergencies in which the exercise of the President's Section 706 war power functions is not required or permitted by law, as well as policy direction for the exercise of the war power functions of the President under Section 706 of the Communications Act. In addition, the NSC provides policy direction and guidance for the overall activities of the NCS and NCC, including their telecommunications mobilization management activities.

3.2 Director, OSTP and the JTRB

If so instructed by the President, the Director, OSTP, is responsible for directing the exercise of the war emergency functions of the President under the Communications Act of 1934, as amended. The Director, OSTP,

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[3]The mobilization activities of the interagency functional groups will be conducted within the overall national level framework for the coordination of major domestic emergencies, i.e., the National System for Emergency Coordination (NSEC), established by the Domestic Policy Council, and the overall framework for national security emergency response currently being developed by the National Security Council (NSC).

also provides, to the President and to Federal departments and agencies with telecommunications resource responsibilities, information, advice, guidance, and assistance regarding the provision, management, or allocation of telecommunications resources during those crises or emergencies in which the President's war power functions are not exercised. In the day-to-day environment, the Director advises the President with respect to the test, exercise, and evaluation of NSEP telecommunications capabilities and reports the results and any recommended remedial actions to the President and the NSC.

The Director, OSTP, may solicit the advice and recommendations of the Joint Telecommunications Resources Board (JTRB). The JTRB is composed of representatives of those Federal departments and agencies with key NSEP telecommunications management-related functions and responsibilities, and assists the Director, OSTP, in the performance of his non-wartime functions and responsiblities. If the situation is serious enough to warrant its involvement, the JTRB, chaired by the Director, OSTP, can serve as a mechanism for policy-level issue and conflict resolution.

3.3 Manager, NCS, and the NCC

The national focal point for telecommunications mobilization management preparedness and response activities is the Office of the Manager, National Communications System (OMNCS), and the joint Industry-Government NCC. The OMNCS has overall responsibility for telecommunications mobilization planning and preparedness, and works closely with the NCS Committee of Principals (COP) and the National Security Telecommunications Advisory Committee (NSTAC) to identify and address mobilization preparedness issues.

The mission of the NCC is to assist in the initiation, coordination, restoration, and reconstitution of NSEP telecommunications services or facilities under all conditions of crisis and emergency. Representatives from those telecommunications companies that play a major role in the provision of NSEP telecommunications services for Federal Government use are resident in the Center on a daily basis along with representatives from key NCS member organizations. In addition, an OMNCS official--the Manager, NCC--provides day-to-day direction for Center activities, and supervises the Center's permanent operational staff.

The NCS member organizations determine their NSEP telecommunications requirements and "prepare policies, plans, and procedures for maximizing the mobilization response capabilities of the telecommunications resources under their management or operational control."[4] Collective advice and assistance regarding OMNCS/NCC activities and operations are provided by the NCS COP, which is the interagency group for NSEP telecommunications, and by the President's NSTAC.

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[4]Section 3(i)(2), Executive Order 12472.

APPENDIX 5-B

PRELIMINARY MOBILIZATION MANAGEMENT STRUCTURE RECOMMENDATIONS

APPENDIX 5-C

EXTRACTS FROM THE FEDERAL ACQUISITION REGULATION (FAR)

PART 50—EXTRAORDINARY CONTRACTUAL ACTIONS

[¶ 31,257]

50.000 Scope of part.

This part prescribes policies and procedures for entering into, amending, or modifying contracts in order to facilitate the national defense under the extraordinary emergency authority granted by Pub. L. 85-804 as amended by Pub. L. 93-155 (50 U.S.C. 1431-1435), as amended, referred to in this part as "the Act," and Executive Order (EO) 10789, dated November 14, 1958, as amended, referred to in this part as "the Executive Order." It does not cover advance payments (see Subpart 32.4).

[¶ 31,258]

50.001 Definitions.

"Approving authority," as used in this part, means an agency official or contract adjustment board authorized to approve actions under the Act and Executive Order.

"Secretarial level," as used in this part, means a level at or above the level of a deputy assistant agency head, or a contract adjustment board.

SUBPART 50.1—GENERAL

[¶ 31,259]

50.101 Authority.

(a) The Act empowers the President to authorize agencies exercising functions in connection with the national defense to enter into, amend, and modify contracts, without regard to other provisions of law related to making, performing, amending, or modifying contracts, whenever the President considers that such action would facilitate the national defense.

(b) The Executive Order authorizes the heads of the following agencies to exercise the authority conferred by the Act and to delegate it to other officials within the agency: the Government Printing Office; the Federal Emergency Management Agency; the Tennessee Valley Authority; the National Aeronautics and Space Administration; the General Services Administration; the Defense, Army, Navy, Air Force, Treasury, Interior, Agriculture, Commerce, and Transportation Departments; the Department of Energy for functions transferred to that Department from other authorized agencies; and any other agency that may be authorized by the President.

[¶ 31,260]

50.102 Policy.

(a) The authority conferred by the Act may not (1) be used in a manner that encourages carelessness and laxity on the part of persons engaged in the defense effort or (2) be relied upon when other adequate legal authority exists within the agency.

(b) Actions authorized under the Act shall be accomplished as expeditiously as practicable, consistent with the care, restraint, and exercise of sound judgment appropriate to the use of such extraordinary authority.

(c) Certain kinds of relief previously available only under the Act; e.g., recission or reformation for mutual mistake, are now available under the authority of the Contract Disputes Act of 1978. In accordance with subparagraph (a)(2) above, Part 33 must be followed in preference to Part 50 for such relief. In case of doubt as to whether Part 33 applies, the contracting officer should seek legal advice.

[¶ 31,261]

50.103 Deviations.

Any deviations to this Part 50 shall not be effective for defense agencies until approved by the Secretary of Defense, and for civilian agencies until approved by the agency head.

[¶ 31,262]

50.104 Reports.

(a) The Act and Executive Order require that each agency listed in 50.101(b) shall submit to Congress annually by March 15 a report of actions taken on requests for relief, including indemnity, under the Act's authority.

(b) The report shall contain the information in subparagraph (1) below for all actions on approved requests, and in subparagraph (2) below for all requests denied. In addition, for each approved request that involves actual or potential cost to the Government in excess of $50,000, the report shall include the

(b) When a case involves matters of interest to more than one Government agency, the interested agencies should maintain liaison with each other to determine whether joint action should be taken.

(c) When additional funds are required from another agency, the contracting agency may not approve adjustment requests before receiving advice that the funds will be available. The request for this advice shall give the contractor's name, the contract number, the amount of proposed relief, a brief description of the contract, and the accounting classification or fund citation. If the other agency makes additional funds available, the agency considering the adjustment request shall be solely responsible for any action taken on the request.

(d) When essentiality to the national defense is an issue (50.302-1(a)), agencies considering requests for amendment without consideration involving another agency shall obtain advice on the issue from the other agency before making the final decision. When this advice is received, the agency considering the request for amendment without consideration shall be responsible for taking whatever action is appropriate.

50.306 Disposition.

When approving or denying a contractor's request made in accordance with 50.303, the approving authority shall sign and date a Memorandum of Decision containing—

(a) The contractor's name and address, the contract identification, and the nature of the request;

(b) A concise description of the supplies or services involved;

(c) The decision reached and the actual cost or estimated potential cost involved, if any;

(d) A statement of the circumstances justifying the decision;

(e) Identification of any of the foregoing information classified "Confidential" or higher (instead of being included in the memorandum, such information may be set forth in a separate classified document referenced in the memorandum); and

(f) If some adjustment is approved, a statement in substantially the following form: "I find that the action authorized herein will facilitate the national defense."

50.307 Contract requirements.

(a) The Act and Executive Order require that every contract entered into, amended, or modified under this Part 50 shall contain—

(1) A citation of the Act and Executive Order;

(2) A brief statement of the circumstances justifying the action; and

(3) A recital of the finding that the action will facilitate the national defense.

(b) The authority in 50.101(a) shall not be used to omit from contracts, when otherwise required, the clauses at 52.203-5, Covenant Against Contingent Fees; 52.215-1, Examination of Records by Comptroller General; 52.222-6, Davis-Bacon Act; 52.222-9, Contract Work Hours and Safety Standards Act—Overtime Compensation—Construction; 52.222-10, Compliance with Copeland Regulations; 52.222-20, Walsh-Healy Public Contracts Act; 52.222-26, Equal Opportunity; and 52.232-23, Assignment of Claims.

SUBPART 50.4—RESIDUAL POWERS

[¶ 31,275]

50.400 Scope of subpart.

This subpart prescribes standards and procedures for exercising residual powers under the Act. The term "residual powers" includes all authority under the Act except (a) that covered by Subpart 50.3 and (b) the authority to make advance payments (see Subpart 32.4).

50.401 Standards for use.

Subject to the limitations in 50.203, residual powers may be used in accordance with the policies in 50.102 when necessary and appropriate, all circumstances considered. In authorizing the inclusion of the clause at 52.250-1, Indemnification Under Public Law 85-804, in a contract or subcontract, an agency head may require the indemnified contractor to provide and maintain financial protection of the type and amount determined appropriate. In deciding whether to approve use of the indemnification clause, and in determining the type and amount of financial protection the indemni-

fied contractor is to provide and maintain, an agency head shall consider such factors as self-insurance, other proof of financial responsibility, workers' compensation insurance, and the availability, cost, and terms of private insurance. The approval and determination shall be final.

50.402 General.

(a) When approving or denying a proposal for the exercise of residual powers, the approving authority shall sign and date a Memorandum of Decision containing substantially the same information called for by 50.306.

(b) Every contract entered into, amended, or modified under residual powers shall comply with the requirements of 50.307.

[¶ 31,278]

50.403 Special procedures for unusually hazardous or nuclear risks.

50.403-1 Indemnification requests.

(a) Contractor requests for the indemnification clause to cover unusually hazardous or nuclear risks should be submitted to the contracting officer and shall include the following information:

(1) Identification of the contract for which the indemnification clause is requested.

(2) Identification and definition of the unusually hazardous or nuclear risks for which indemnification is requested, with a statement indicating how the contractor would be exposed to them.

(3) A statement, executed by a corporate official with binding contractual authority, of all insurance coverage applicable to the risks to be defined in the contract as unusually hazardous or nuclear, including—

(i) Names of insurance companies, policy numbers, and expiration dates;

(ii) A description of the types of insurance provided (including the extent to which the contractor is self-insured or intends to self-insure), with emphasis on identifying the risks insured against and the coverage extended to persons or property, or both;

(iii) Dollar limits per occurrence and annually, and any other limitation, for relevant segments of the total insurance coverage;

(iv) Deductibles, if any, applicable to losses under the policies;

(v) Any exclusions from coverage under such policies for unusually hazardous or nuclear risks; and

(vi) Applicable workers' compensation insurance coverage.

(4) The controlling or limiting factors for determining the amount of financial protection the contractor is to provide and maintain, with information regarding the availability, cost, and terms of additional insurance or other forms of financial protection.

(5) Whether the contractor's insurance program has been approved or accepted by any Government agency; and whether the contractor has an indemnification agreement covering similar risks under any other Government program, and, if so, a brief description of any limitations.

(6) If the contractor is a division or subsidiary of a parent corporation, (i) a statement of any insurance coverage of the parent corporation that bears on the risks for which the contractor seeks indemnification and (ii) a description of the precise legal relationship between parent and subsidiary or division.

(b) If the dollar value of the contractor's insurance coverage varies by 10 percent or more from that stated in an indemnification request submitted in accordance with paragraph (a) above, or if other significant changes in insurance coverage occur after submission and before approval, the contractor shall immediately submit to the contracting officer a brief description of the changes.

50.403-2 Action on indemnification requests.

(a) The contracting officer, with assistance from legal counsel and cognizant program office personnel, shall review the indemnification request and ascertain whether it contains all required information. If the contracting officer, after considering the facts and evidence, denies the request, the contracting officer shall notify the contractor promptly of the denial and of the reasons for it. If recommending approval, the contracting officer shall forward the request (as modified, if necessary, by negotiation) through channels to the appropriate official specified in 50.201(d). The contracting

APPENDIX 5-D

EXTRACTS FROM DEFENSE PRIORITIES AND ALLOCATIONS SYSTEM (DPAS)

Subpart A—Purpose

350.1 Purpose of this regulation.

(a) Title I of the Defense Production Act of 1950, as amended (50 U.S.C. app. 2061, *et seq.)* (Defense Production Act), authorizes the President: to require the priority performance of contracts and orders necessary or appropriate to promote the national defense over other contracts or orders; to allocate materials and facilities as necessary or appropriate to promote the national defense; and to require the allocation of, or the priority performance under contracts or orders relating to, supplies of materials and equipment in order to assure domestic energy supplies for national defense needs.

(b) This regulation consolidates, simplifies, and revises the Defense Materials System and the Defense Priorities System regulations, directions, and orders. The Defense Priorities and Allocations System (DPAS) helps to keep current national defense programs on schedule and provides an operating system that can be rapidly expanded in a national emergency.

(c) To aid in understanding and using the DPAS, an overview of its major provisions is incorporated into this regulation as Subpart B—Overview. The full text of the DPAS is found in Subparts D through L.

Subpart B—Overview

350.2 Introduction.

(a) The Federal Emergency Management Agency authorizes certain national defense programs for priorities and allocations support. For example, military aircraft production, ammunition, and certain programs which maximize domestic energy supplies are "authorized programs." A complete list of currently authorized programs is provided at Schedule I.

(b) To ensure the preferential treatment of certain contracts and orders for authorized programs, the Department of Commerce administers the DPAS.

(c) Commerce has delegated authority to place priority ratings on contracts or orders necessary or appropriate to promote the national defense to the government agencies that issue such contracts or orders. Schedule I includes a list of agencies delegated this authority. Copies of the Delegations of Authority are provided at Appendix I. They set forth the authorities delegated and those retained by Commerce.

350.3 Priority ratings and rated orders.

(a) Rated orders are identified by a priority rating consisting of the rating—either DX or DO—and a program identification symbol. Rated orders take preference over all unrated orders as necessary to meet required delivery dates. Among rated orders, DX rated orders take preference over DO rated orders. Program identification symbols indicate which authorized program is involved with the rated order. For example, A1 identifies

defense aircraft programs and A7 signifies defense electronic programs. The program identification symbols, in themselves, do not connote any priority.

(b) Persons receiving rated orders must give them preferential treatment as required by this regulation. This means a person must accept and fill a rated order for items that the person normally supplies. The existence of previously accepted unrated or lower rated orders is not sufficient reason for rejecting a rated order. Persons are required to reschedule unrated orders if they conflict with performance against a rated order. Similarly, persons must reschedule DO rated orders if they conflict with performance against a DX rated order.

(c) All rated orders must be scheduled to the extent possible to ensure delivery by the required delivery date.

(d) Persons who receive rated orders must in turn place rated orders with their suppliers for the items they need to fill the orders. This provision ensures that suppliers will give priority treatment to rated orders from contractor to subcontractor to suppliers throughout the procurement chain.

(e) Persons may place a priority rating on orders only when they are in receipt of a rated order, have been explicitly authorized to do so by the Department of Commerce or a Delegate Agency, or are otherwise permitted to do so by this regulation.

350.4 Controlled materials.

(a) Federal central management of certain key materials, designated "controlled materials", has been essential in the past to effective industrial mobilizations. Accordingly, special rules are maintained in peacetime to provide an operating mechanism that can be rapidly expanded during a national emergency to meet increased defense and other essential needs. Currently, the controlled materials are steel, copper, aluminum, and nickel alloys.

(b) Under the controlled materials program, the Department of Commerce requires suppliers of controlled materials to accept rated orders up to a specified quantity of material during a given period of time. This quantity is called a "set-aside". This provision ensures that the material will be available when rated orders are placed. In addition, the system ensures that controlled materials producers are treated equitably, for after the set-aside quantity levels have been reached, controlled materials producers may generally reject additional rated orders. These orders would then be filled by other controlled materials producers who had not exhausted their set-aside requirement.

(c) In time of national emergency, the level and scope of the controlled materials program may be greatly expanded to ensure the necessary allocation of materials and in order to direct general industrial activity toward supporting the requirements of the emergency.

(d) Certain other items, in addition to the controlled materials, have critical importance to national defense programs. From time-to-time,

special rules, similar to those for controlled materials, may be needed to manage those materials.

(e) If items become scarce and critical and the requirements of the national defense cannot be met without creating a significant dislocation in the civilian market place so as to create appreciable hardship, special rules may be established under section 101(b) of the Defense Production Act to control the general distribution of such items in the civilian market.

350.5 Special priorities assistance.

(a) The DPAS is designed to be largely self-executing. However, from time-to-time production or delivery problems will arise. In this event, special priorities assistance is available from Commerce and from the Delegate Agencies.

(b) Special priorities assistance is available for any reason consistent with this regulation. Generally, special priorities assistance is provided to expedite deliveries, resolve delivery conflicts, place rated orders, locate suppliers, or to verify information supplied by customers and vendors. Special priorities assistance may also be used to request rating authority for items not automatically ratable.

350.6 Official actions.

When necessary, Commerce takes specific official actions to implement or enforce the provisions of this regulation and to provide special priorities assistance. Such actions may include the issuance of: Rating Authorizations, Directives, Letters of Understanding, Set-asides, and compliance documents (Administrative Subpoenas, Demands for Information, and Inspection Authorizations).

350.7 Compliance.

(a) Compliance with the provisions of this regulation and official actions is required by the Defense Production Act. Violators are subject to criminal penalties.

(b) Any person who places or receives a rated order should be thoroughly familiar with, and must comply with, the provisions of this regulation.

Subpart C—Definitions.

350.8 Definitions.

The following definitions pertain to all sections of the regulation:

"Authorized program"—a program approved by the Federal Emergency Management Agency for priorities and allocations support under the Defense Production Act.

"Construction"—the erection, addition, extension, or alteration of any building, structure, or project, using materials or products which are to be

an integral and permanent part of the building, structure, or project. Construction does not include maintenance and repair.

"Controlled materials"—the various shapes and forms of steel, copper, aluminum, and nickel alloys, whether new, remelted, rerolled or redrawn, as specified in Schedule II, and as defined in Schedule III.

"Controlled materials suppliers"—all persons, including producers, distributors, brokers, importers and exporters engaged in the sale or resale of controlled materials.

"Delegate Agency"—a government agency authorized by delegation from the Department of Commerce to place priority ratings on contracts or orders needed to support authorized programs.

"Defense Production Act"—the Defense Production Act of 1950, as amended (50 U.S.C. app. 2061, *et seq.*).

"Distributors of controlled materials"—those persons (including warehouse operators or jobbers, but not retailers) engaged in stocking controlled materials at locations regularly maintained for their sale or resale in the form or shape as received, or after performing such operations as cutting to length or shape, slitting, shearing, or sorting and grading.

"Further conversion"—the further processing of controlled materials by a processor of such materials.

"Item"—any raw, in process, or manufactured material, article, commodity, supply, equipment, component, accessory, part, assembly, or product of any kind, technical information, process, or service.

"Lead time"—the period of time specified in this regulation for the receipt of orders for controlled materials by a supplier in advance of the first day of the month in which shipment is required.

"Maintenance and repair and operating supplies (MRO)"—

(a) "Maintenance" is the upkeep necessary to continue any plant, facility, or equipment in working condition.

(b) "Repair" is the restoration of any plant, facility, or equipment to working condition when it has been rendered unsafe or unfit for service by wear and tear, damage, or failure of parts.

(c) "Operating supplies" are any items carried as operating supplies according to a person's established accounting practice. Operating supplies may include hand tools and expendable tools, jigs, dies, fixtures used on production equipment, lubricants, cleaners, chemicals and other expendable items.

(d) MRO does not include items produced or obtained for sale to other persons or for installation upon or attachment to the property of another person, or items required for the production of such items; items needed for the replacement of any plant, facility, or equipment; or items for the improvement of any plant, facility, or equipment by replacing items which are still in working condition with items of a new or different kind, quality, or design.

"Minimum mill quantity"—the minimum quantity of a controlled material that may be obtained from a producer for shipment at any one time to any one destination.

"Official action"—an action taken by Commerce under the authority of the Defense Production Act and this regulation. Such actions include the issuance of Set-asides, Rating Authorizations, Directives, Letters of Understanding, Demands for Information, Inspection Authorizations, and Administrative Subpoenas.

"Person"—any individual, corporation, partnership, association, or any other organized group of persons, and includes any agency of the United States Government or any other government.

"Production equipment"—any item of capital equipment used in producing materials or furnishing services that has a unit acquisition cost of $2,500 or more, an anticipated service life in excess of one year, and the potential for maintaining its integrity as a capital item.

"Rated order"—a prime contract, a subcontract, or a purchase order in support of an authorized program issued in accordance with the provisions of this regulation.

"Set-aside"—the amount of an item for which a supplier must reserve order book space in anticipation of the receipt of rated orders.

Subpart D—Industrial Priorities

350.10 Delegation of authority.

(a) The priorities and allocations authorities given to the President in Title I of the Defense Production Act have been delegated to the Director of the Federal Emergency Management Agency (FEMA), who, in turn, has delegated these authorities with respect to industrial resources to the Secretary of Commerce. FEMA retains the overall policy and coordinating functions for this delegated authority.

(b) Within the Department of Commerce, these responsibilities have been assigned to the Office of Industrial Resource Administration. The Department of Commerce has authorized the Delegate Agencies to assign priority ratings to orders for items needed for authorized programs. Copies of these Delegations of Authority are provided at Appendix 1. They set forth the authorities delegated and those retained by Commerce.

350.11 Priority ratings.

(a) *Levels of priority.* (1) There are two levels of priority established by this regulation, identified by the rating symbols "DO" and "DX".

(2) All DO rated orders have equal priority with each other and take preference over unrated orders. All DX rated orders have equal priority with each other and take preference over DO rated orders and unrated orders. (For resolution of conflicts among rated orders of equal priority, see section 350.14(c).)

(3) In addition, a Directive issued by Commerce takes preference over any DX rated order, DO rated order, or unrated order, as stipulated in the Directive. (For a full discussion of Directives, see section 350.62.)

(b) *Program identification symbols.* Program identification symbols indicate which authorized program is being supported by a rated order. The list of authorized programs and their identification symbols are listed in Schedule I. For example, A1 identifies defense aircraft programs and A7 signifies defense electronic programs. Program identification symbols, in themselves, do not connote any priority.

(c) *Priority ratings.* A priority rating consists of the rating symbol—DO and DX—and the program identification symbol, such as A1, B2, or H6. Thus, a contract for the production of an aircraft will contain a DO-A1 or DX-A1 priority rating. A contract for a radar set will contain a DO-A7 or DX-A7 priority rating.

350.12 Elements of a rated order.

Each rated order must include:

(a) The appropriate priority rating (e.g. DO-A1, DX-A4, DO-H1);

(b) A required delivery date or dates. The words "immediately" or "as soon as possible" do not constitute a delivery date. A "requirements contract" bearing a priority rating may contain no specific delivery date or dates and may provide for the furnishing of items from time-to-time or within a stated period against specific purchase orders or "calls". Such "calls" must specify a required delivery date or dates and are to be considered as rated as of the date of their receipt by the supplier and not as of the date of the original "requirements contract";

(c) The signature of an individual authorized to sign rated orders for the person placing the order. The signature certifies that the rated order is authorized under this regulation and that the requirements of this regulation are being followed; and

(d) A statement that reads in substance:

> This is a rated order certified for national defense use, and you are required to follow all the provisions of the Defense Priorities and Allocations System regulation (15 CFR 350).

350.13 Acceptance and rejection of rated orders.

(a) *Mandatory acceptance.* (1) Except as otherwise specified in this section, a person shall accept every rated order received and must fill such orders regardless of any other rated or unrated orders that have been accepted.

(2) A person shall not discriminate against rated orders in any manner such as by charging higher prices or by imposing different terms and conditions than for comparable unrated orders.

(b) *Mandatory rejection.* Unless otherwise directed by Commerce:

(1) A person shall not accept a rated order for delivery on a specific date if unable to fill the order by that date. However, the person must inform the customer of the earliest date on which delivery can be made and offer to accept the order on the basis of that date. Scheduling conflicts with previously accepted lower rated or unrated orders are not sufficient reason for rejection under this section.

(2) A person shall not accept a DO rated order for delivery on a date which would interfere with delivery of any previously accepted DO or DX rated orders. However, the person must offer to accept the order based on the earliest delivery date otherwise possible.

(3) A person shall not accept a DX rated order for delivery on a date which would interfere with delivery of any previously accepted DX rated orders, but must offer to accept the order based on the earliest delivery date otherwise possible.

(c) *Optional rejection.* Unless otherwise directed by Commerce, rated orders may be rejected in any of the following cases as long as a supplier does not discriminate among customers:

(1) If the person placing the order is unwilling or unable to meet regularly established terms of sale or payment;

(2) If the order is for an item not supplied or for a service not performed;

(3) If the order is for an item produced, acquired, or provided only for the supplier's own use for which no orders have been filled for two years prior to the date of receipt of the rated order. If, however, a supplier has sold some of these items, the supplier is obligated to accept rated orders up to that quantity or portion of production, whichever is greater, sold within the past two years;

(4) If the person placing the rated order, other than the U.S. Government, makes the item or performs the service being ordered;

(5) If the rated order is for a controlled material in an amount below the minimum mill quantity established in Schedule II, and the person placing the order is not willing to buy the minimum quantity;

(6) If the rated order is for a controlled material and is not received by the controlled materials producer within the time frame specified in Schedule I;

(7) If the applicable set-aside has been reached or would be exceeded by acceptance, except that a DX order must be accepted without regard for such set-aside;

(8) If acceptance of a rated order or performance against a rated order would violate any other regulation, official action, or order of the Department of Commerce issued under the authority of the Defense Production Act (see section 350.75).

(d) *Customer notification requirements.* (1) A person must accept or reject a rated order in writing within ten working days after receipt of a DO rated order and within five working days after receipt of a DX rated order. The person must give reasons in writing for the rejection.

(2) If a person has accepted a rated order and later discovers that, due to circumstances beyond the person's control, deliveries will be delayed, the person must notify the customer immediately, give the reasons for the delay, and advise of a new shipment date. If notification is given verbally, written confirmation must be provided within five working days.

350.14 Preferential scheduling.

(a) A person must schedule operations, including the acquisition of all needed production items, in a timely manner to satisfy the delivery requirements of each rated order. Modifying production or delivery schedules is necessary only when required delivery dates for rated orders cannot otherwise be met.

(b) DO rated orders must be given production preference over unrated orders, if necessary to meet required delivery dates, even if this requires the diversion of items being processed or ready for delivery against unrated orders. Similarly, DX rated orders must be given preference over DO rated orders and unrated orders.

> Examples: If a person receives a DO rated order with a delivery date of June 3 and if meeting that date would mean delaying production or delivery of an item for an unrated order, the unrated order must be delayed. If a DX rated order is received calling for delivery on July 15 and a person has a DO rated order requiring delivery on June 2 and operations can be scheduled to meet both deliveries, there is no need to alter production schedules to give any additional preference to the DX rated order.

(c) If a person cannot fill all the rated orders of equal priority status received on the same day, the person must accept those orders which can be filled which have the earliest delivery dates. For example, the person must accept order A requiring delivery on December 15 before accepting order B requiring delivery on December 31. For those orders which cannot be filled on time, the supplier must inform the customer within the time limits set forth in section 350.13(d), of the earliest date on which delivery can be made and offer to accept the order on the basis of that date.

(d) If a person is unable to purchase needed production items in time to fill a rated order by its required delivery date, the person must fill the rated order by using inventoried production items. A person who uses inventoried items to fill a rated order may replace those items with the use of a rated order as provided in section 350.17(b).

350.15 Extension of priority ratings.

(a) A person must use rated orders with suppliers to obtain items needed to fill a rated order. The person must use the priority rating indicated on the customer's rated order, except as otherwise provided in this regulation or as directed by the Department of Commerce.

> For example, if a person is in receipt of a DO-A3 rated order for a navigation system and needs to purchase semiconductors for its manufacture, that person must use a DO-A3 rated order to obtain the needed semiconductors.

(b) The priority rating must be included on each successive order placed to obtain items needed to fill a customer's rated order. This

continues from contractor to subcontractor to supplier throughout the entire procurement chain.

350.16 Changes or cancellations of priority ratings and rated orders.

(a) The priority rating on a rated order may be changed or cancelled by:

(1) An official action of the Department of Commerce; or

(2) Written notification from the person who placed the rated order (including a Delegate Agency).

(b) If an unrated order is amended so as to make it a rated order, or a DO rating is changed to a DX rating, the supplier must give the appropriate preferential treatment to the order as of the date the change is received by the supplier.

(c) An amendment to a rated order that significantly alters a supplier's original production or delivery schedule shall constitute a new rated order as of the date of its receipt. The supplier must accept or reject the amended order according to the provisions of section 350.13.

(d) The following amendments do not constitute a new rated order: a change in shipping destination; a reduction in the total amount of the order; an increase in the total amount of the order which has negligible impact upon deliveries; a minor variation in size or design; or a change which is agreed upon between the supplier and the customer.

(e) If a person no longer needs items to fill a rated order, any rated orders placed with suppliers for the items, or the priority rating on those orders, must be cancelled.

(f) When a priority rating is added to an unrated order, or is changed or cancelled, all suppliers must be promptly notified in writing.

350.17 Use of rated orders.

(a) A person must use rated orders to obtain:

(1) Items which will be physically incorporated into other items to fill rated orders, including that portion of such items normally consumed, or converted into scrap or by-products, in the course of processing;

(2) Containers or other packaging materials required to make delivery of the finished items against rated orders;

(3) Services, other than contracts of employment, needed to fill rated orders; and

(4) MRO needed to produce the finished items to fill rated orders. However, for MRO, the priority rating used must contain the program identification symbol H7 along with the rating symbol contained on the customer's rated order. For example, a person in receipt of a DO-A3 rated order, who needs MRO, would place a DO-H7 rated order with the person's supplier.

(b) A person may use a rated order to replace inventoried items (including finished items) if such items were used to fill rated orders, as follows:

(1) The order must be placed within 90 days of the date of use of the inventory.

(2) A DO rating symbol and the program identification symbol indicated on the customer's rated order must be used on the order (except as provided in section 350.31(d)—Controlled materials program identification symbols). A DX rating symbol may not be used even if the inventory was used to fill a DX rated order.

(3) If the priority ratings on rated orders from one customer or several customers contain different program identification symbols, the rated orders may be combined. In this case, the program identification symbol H1 must be used (i.e., DO-H1) (not applicable to controlled materials producers).

(c) A person may combine DX and DO rated orders from one customer or several customers if the items covered by each level of priority are identified separately and clearly. If different program identification symbols are indicated on those rated orders of equal priority, the person must use the program identification symbol H1 (i.e., DO-H1 or DX-H1), except as provided in section 350.31(d) (Controlled materials program identification symbols).

(d) *Combining rated and unrated orders.* (1) A person may combine rated and unrated orders provided that the rated quantities are identified separately and are also contained in a separate rated order which conforms to the requirements of section 350.12 (Elements of a rated order). In addition to identifying clearly the rated quantities, the combined purchase order must contain a statement that the rated quantities are contained in a separate rated order placed in accordance with this regulation. Wherever possible, the separate rated order must be physically attached to the combined purchase order. A supplier must give preferential treatment to the rated quantities of the combined order, if necessary. A supplier may not use the authorities of this regulation to give preferential treatment to the unrated portion.

(2) Any supplier who believes that rated and unrated orders are being combined in a manner contrary to the intent of this regulation or in a fashion that causes undue or exceptional hardship may submit a request for adjustment or exception under section 350.80.

(e) A person may place a rated order for the minimum commercially procurable quantity even if the quantity needed to fill a rated order is less than that minimum. However, a person must combine rated orders as provided in paragraph (c), if possible, to obtain minimum procurable quantities .

(f) A person is not required to place a priority rating on an order for less than $5,000 provided that delivery can be obtained in a timely fashion without the use of the priority rating.

350.18 Limitations on placing rated orders.

(a) *General limitations* (1) A person may not place a DO or DX rated order unless entitled to do so under this regulation.

(2) Rated orders may not be used to obtain:

(i) Delivery on a date earlier than needed;

(ii) A greater quantity of the item than needed, except to obtain a minimum procurable quantity. Separate rated orders may not be placed solely for the purpose of obtaining minimum procurable quantities on each order;

(iii) Items in advance of the receipt of a rated order, except as specifically authorized by Commerce (see section 350.51(c) for information on obtaining authorization for a priority rating in advance of a rated order); or

(iv) Any of the following items unless specific priority rating authority has been obtained from a Delegate Agency or Commerce:

(A) Items for plant improvement, expansion or construction, unless they will be physically incorporated into a construction project covered by a rated order; and

(B) Production or construction equipment or items to be used for the manufacture of production equipment. (For information on requesting priority rating authority, see section 350.53.)

(b) *Jurisdictional limitations.* (1) The priorities and allocations authority for certain items has been delegated under Executive Order 10480, as amended, to other agencies, and, thus, the provisions of this regulation are not applicable to them. These items include:

(i) Petroleum, gas, solid fuel, and electric power and all other forms of energy (Department of Energy);

(ii) Food and the domestic distribution of farm equipment and commercial fertilizer (Department of Agriculture);

(iii) Civil transportation and the movement of persons and property by all all modes (Department of Transportation);

(iv) Minerals (Department of Interior);

(v) Water (Department of Defense—U.S. Army Corps of Engineers);

(vi) Housing facilities (Department of Housing and Urban Development);

(vii) Health facilities (Department of Health and Human Services); and

(viii) Radioisotopes, stable isotopes, source material, and special nuclear material, produced in Government-owned plants or facilities operated by or for the Department of Energy (Department of Energy).

(2) The jurisdiction of the Department of Commerce and the Departments of Energy, Agriculture, and the Interior over certain specific items included in the categories listed above has been clarified by Interagency Memoranda of Understanding. Copies of these Memoranda are provided for information at Appendix II.

(3) The following items under the jurisdiction of Commerce are currently excluded from the rating provisions of this regulation; however,

these items are subject to Commerce Directives. These excluded items are:

Communication services
Copper raw materials (as defined in Schedule III)
Crushed stone
Gravel
Sand
Scrap
Slag
Steam heat, central
Waste paper

Subpart H—Special Priorities Assistance

350.50 General provisions.

(a) The DPAS is designed to be largely self-executing. However, it is anticipated that from time-to-time problems will occur. In this event, a person should immediately contact the appropriate contract administration officer for guidance or assistance. If additional formal aid is needed, special priorities assistance should be sought from the Delegate Agency through the contract administration officer. If the Delegate Agency is unable to resolve the problem or to authorize the use of a priority rating and believes additional assistance is warranted, the Delegate Agency may forward the request to the Department of Commerce for action. Special priorities assistance is a service provided to alleviate problems that do arise.

(b) Special priorities assistance can be provided for any reason in support of this regulation, such as assisting in obtaining timely deliveries of items needed to satisfy rated orders or authorizing the use of priority ratings on orders to obtain items not automatically ratable under this regulation.

(c) A request for special priorities assistance or priority rating authority must be submitted on Form ITA-999 (OMB #0625-0015) to the local contract administration representative. Form ITA-999 may be obtained from the Delegate Agency representative, any Commerce District Office, or from the Department of Commerce. A sample Form ITA-999 is attached at Appendix III.

6.0 DEPENDENCE ON FOREIGN SOURCES
FINAL REPORT

October 1987

ADDENDUM

On October 6, 1987, the Industry Executive Subcommittee (IES) of the National Security Telecommunications Advisory Committee (NSTAC) approved the recommendations made in this report, subject to the following changes in the wording of the first recommendation pertaining to equipment, materials, and components other than semiconductors. The IES-approved recommendation is as follows:

- The Government, in conjunction with the NSTAC, should establish a mechanism to monitor and assess telecommunications industry dependence on foreign sources for identified Government mobilization needs.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

The extent of the telecommunications industry's dependence on foreign sources for raw materials, components, parts, and equipment is a key area of concern in evaluating the industry's ability to maintain service and production capabilities and to accommodate increased service and equipment demands under mobilization conditions. The Joint Industry-Government Telecommunications Industry Mobilization (TIM) Group was established by the President's National Security Telecommunications Advisory Committee (NSTAC) and the National Communications System (NCS) Committee of Principals (COP) to: (1) identify possible impediments to effective telecommunications industry mobilization and (2) assist in the development of corrective actions to overcome any identified impediments. This report documents the Joint Group's final findings, conclusions, and recommendations regarding the industry's overall dependence on foreign sources.

Using the work of the earlier NSTAC TIM Task Force as a starting point, the Joint TIM Group sought information from Federal government and private research organizations that had previously studied the issue of foreign procurement or foreign dependence. The Group focused initially on the telecommunications industry's dependence on foreign-sourced semiconductors, providing recommendations on semiconductor dependency to the NSTAC in February 1987 and to the COP in March 1987. The subsequent focus of the Group's study was equipment, materials, and components other than semiconductors. A survey of NSTAC member companies was conducted to support this aspect of the study. The Dependence on Foreign Sources Survey was designed to elicit the views of NSTAC companies concerning their own, as well as the industry's, dependence on foreign sources for materials, equipment, and components other than semiconductors. The survey focused on four major types of equipment: digital central office switching equipment, fiber optic electronic terminal equipment, telephone sets, and satellite ground stations. Nineteen NSTAC companies provided responses to the survey.

On the basis of the survey results and other information obtained from the literature, briefings, and consultation with experts in the Federal Government and the private sector, the Joint TIM Group developed its findings, conclusions, and recommendations.

Conclusions

The increasing dependence of the telecommunications industry on foreign sources raises significant questions about the industry's ability to respond to and sustain mobilization requirements. On the basis of briefings received, reports reviewed, and responses to the NSTAC Dependence on Foreign Sources Survey, the Joint TIM Group has reached the following conclusions:

(1) Semiconductors

(a) At this time, if foreign-sourced semiconductors became unavailable, it would not have significant impact upon the provision of telecommunications service during Short-Term (0 to 90 days) and Mid-Term (90 to 180 days) mobilization. While production of telecommunications equipment would be adversely affected in the Short- and Mid-Term, available equipment could be allocated to meet mobilization-related national security emergency preparedness (NSEP) needs.

(b) At this time, to the extent that foreign-sourced semiconductors became unavailable, expansion of telecommunications service capacity would be constrained during Short- and Mid-Term mobilization, and overall capacity would be reduced in the Long-Term because the telecommunications industry would be competing with other entities (e.g., the Department of Defense) for the allocation of available supplies.

(2) Equipment, Materials, and Components Other Than Semiconductors

(a) In the Short Term and Mid-Term, the service sector of the U.S. telecommunications industry would not be immediately or severely affected by disruption of the supply of foreign items. Adverse effects would be felt as foreign equipment fails or requires repair parts.

(b) The manufacturing sector of the U.S. telecommunications industry could be immediately affected by a cut-off of critical foreign-sourced supplies, equipment, or materials. The effects on production would depend, in part, on the quantities of foreign-sourced items in domestic inventories and in the supply pipeline.

(c) The U.S. industry's foreign dependence presents a changing picture in terms of the specific equipment, components, and materials for which dependency exists as well as the degree of dependence for each. Today's list of foreign dependence items is different from last year's, and next year's will differ from today's. The following conclusions and observations reflect the current picture as drawn by the NSTAC Foreign Dependence Survey and related studies:

- In view of the large number of foreign-made fiber optic terminals embedded in U.S. telecommunications systems (about 35 percent foreign according to some estimates) and the inherent incompatibility between terminals made by different manufacturers, the foreign-made terminals and their interfacing connectors could become a problem if maintenance or expanded capacity is required.

- The U.S. currently imports over 60 percent of the telephone sets it uses. Although the demand for telephone sets

during mobilization is not known, the fact that imports have risen to this level suggests that telephone sets could be a problem during mobilization. Therefore, the Joint TIM Group concluded that domestic production and import status of telephone sets should be periodically monitored.

- The foreign dependence status of the ceramic resonators should be studied in depth, with a view toward identifying possible steps to reduce the degree of foreign dependence. The availability status of four other critical items--fiber optic terminals, fiber optic connectors, telephone sets, and ferrite cores--should be periodically monitored for the same purpose.

Recommendations

On the basis of its conclusions regarding the impact of semiconductor foreign dependency on the telecommunications industry, the Joint TIM Group offered the following recommendation:

- Semiconductors are major components of the equipment used by the telecommunications industry, and the industry is almost totally dependent on foreign-sourced semiconductors. Accordingly, the ongoing National Security Council and Defense Science Board efforts in this area are strongly supported. The President should direct action to identify steps to mitigate the impact of the loss of foreign-sourced semiconductors on the telecommunications industry.

Further, on the basis of its collective assessment of the responses to the NSTAC-wide Dependence on Foreign Sources survey, the Joint Group has identified other dependencies of concern from a mobilization perspective. While these dependencies may not have the same wide-ranging significance to the telecommunications industry as semiconductor dependency, they are important. Accordingly, the Joint TIM Group offers the following recommendations:

- The Government, in conjunction with NSTAC, should establish a mechanism to periodically assess industry dependence on foreign sources in light of identified Government mobilization needs.

- The NCS and NSTAC should jointly keep the Executive Office of the President (EOP) apprised of any specific foreign dependency issues relating to telecommunications, and identify, if necessary, possible measures for reducing or mitigating these foreign dependencies.

- In conjunction with the above Government action, the NSTAC member firms should ensure that their appropriate internal organizations

are made aware of the findings of the joint TIM Group. Further, their internal organizations should be apprised of the need to plan for contingencies such as a cut-off of non-North American supplied material during a mobilization.

6.1 Introduction

The Joint Industry-Government Telecommunications Industry Mobilization (TIM) Group was established by the President's National Security Telecommunications Advisory Committee (NSTAC) and the NCS Committee of Principals (COP) to: (1) identify possible impediments to effective telecommunications industry mobilization and mobilization planning and (2) assist in the development of corrective actions to overcome any identified impediments. The extent of the telecommunications industry's dependence on foreign sources for raw materials, components, parts, and equipment is a key area of concern to the Joint TIM Group in its evaluation of the industry's ability to maintain existing service and production capabilities and to accommodate increased service and equipment demands under mobilization conditions. This report documents the Group's final findings, conclusions, and recommendations regarding telecommunications industry dependence on foreign sources and its potential effects on mobilization.

For the purpose of the TIM study, foreign-sourced items are those manufactured, assembled, or otherwise processed outside of the United States and Canada.[1] Sources within these countries are referred to as North American sources. It should be noted that the Joint TIM Group has distinguished between the issue of dependence on foreign sources and the broader, more inclusive issue of procurement from foreign sources.

Foreign source procurement does not, in the view of the Joint TIM Group, necessarily equate to foreign source dependence and involves consideration of a range of trade, economic, national security, and foreign relations issues that are beyond the scope of the Group's objectives. The Joint TIM Group has focused on the narrower issue of the industry's dependence on foreign sources and the implications of any dependencies for effective industry mobilization. In its study, the Joint Group has recognized that concerns about foreign source dependency grow out of the possibility that foreign sources of supply could be cut off under a variety of mobilization conditions. The Group has thus assumed, for purposes of its general investigation, that a cut-off of foreign supplies would occur coincident with the beginning of mobilization.[2]

6.2 Background/Approach

In December 1984, the NCS asked the NSTAC to assist the Government in assessing telecommunications industry mobilization and mobilization planning capabilities. In response to the Government's request, the NSTAC

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[1] Foreign source definition based on definition of "Industrial Base" in DoD Directive 4005.1, Enclosure 2, SUBJECT: Industrial Preparedness Program, November 26, 1985.

[2] The specific mobilization interval and time periods addressed by the Joint TIM Group are discussed in Section 6.2.

TABLE 6-1
JOINT TIM GROUP BRIEFINGS AND INTERVIEWS

BRIEFINGS

TITLE/SUBJECT OF STUDY	CONDUCTED BY	BRIEFED BY
Defense Science Board Semiconductor Study	Institute for Defense Analyses (IDA) for the Department of Defense	Richard H. Van Atta Director, Technology Security Policy Institute for Defense Analyses
IDA Electronics Dependency Project	Institute for Defense Analyses	Richard H. Van Atta
Joint Logistics Commanders' Study on U.S. Precision Optics Production Base	Department of Defense	Paige Sullivan Office of Industrial Base Assessment Department of Defense
Joint Logistics Commanders' Study on Effects of Foreign Dependency	The Analytic Sciences Corporation (TASC) for the Department of Defense	John F. Starns Staff Analyst The Analytic Sciences Corporation
National Security Assessment of Critical Gas Turbine Engine Subcontractors	Department of Commerce, for the Department of Defense	Paige Sullivan Department of Defense (formerly with Department of Commerce)
Joint Logistics Commanders' Bearings Study	Department of Commerce, for the U.S. Air Force	Brad Botwin and John Tucker Office of Industrial Resource Administation Department of Commerce

TABLE 6-1
JOINT TIM GROUP BRIEFINGS AND INTERVIEWS
(CONCLUDED)

BRIEFINGS

TITLE/SUBJECT OF STUDY	CONDUCTED BY	BRIEFED BY
Survey of Foreign Dependency Studies	Mobilization Concepts Development Center, National Defense University	William B. Taylor Director, Mobilization Concepts Development Center, National Defense University
Study on International Competitiveness	Amercian Electronics Association	Stephen R. Levy Chairman of the Board, Bolt Beranek and Newman, and President, American Electronics Association
Strategic Materials for Electronics Applications	U.S. Bureau of Mines	John D. Morgan Chief Staff Officer U.S. Bureau of Mines

INTERVIEWS BY TIME GROUP STAFF

PERSONS INTERVIEWED	AFFILIATION
Gregory D. Foster	Director, Command and Control Research Program, National Defense University
William J. Sullivan	National Telecommunications and Information Administration, Department of Commerce

Recent studies clearly show that the U.S. electronics industry is highly dependent on semiconductors produced offshore. The Group therefore decided to exclude semiconductors as an equipment category to be addressed in the survey. Semiconductors are included, however, in the Group's conclusions and recommendations that are based on the findings of other studies.

The Joint Group was sensitive to industry concerns about proprietary information that might be involved in the survey, and worked with the Office of the Manager, NCS (OMNCS) to establish information handling and processing procedures to accommodate those concerns.

After numerous meetings of a specially-organized subgroup that included all industry members, the Joint TIM Group agreed on five questions to be asked of all NSTAC member companies:

1. What, if any, particular items, materials, or components (excluding semiconductors) associated with the four types of equipment identified [above]...warrant detailed study by the Joint TIM Group from a foreign dependency/mobilization perspective?

2. In your estimation, how would the unavailability of foreign sourced materials and components (excluding semiconductors) affect your company's ability to continue to produce, operate, maintain or integrate the four types of equipment identified [above]? In addition, please identify, if possible, those companies which would constitute primary alternative domestic sources.

3. In your estimation, how would the unavailability of foreign sourced materials and components (excluding semiconductors) for these types of equipment constrain or impair the telecommunications industry's ability to mobilize and/or sustain a long term (beyond six months) mobilization effort?

4. What steps might industry and/or the Federal Government take to mitigate, reduce, or eliminate any adverse effects of foreign dependencies on the telecommunications industry's ability to mobilize effectively and to sustain a long term mobilization effort?

5. Other comments or suggestions (e.g., What other important aspects or dimensions of the dependence on foreign sources issue should be addressed by the Joint TIM Group? Are there other types of equipment that should be studied? Are there identifiable trends toward greater or lesser reliance on foreign sources?)

The above questions, together with background material and instructions to respondents, were prepared after consultation with specialists from the Department of Defense and Department of Commerce who had experience in preparing and administering industry surveys. However, the questions reflect the Joint TIM Group's decision concerning the information it needed from the NSTAC companies.

A pilot version of the questionnaire was administered to the industry members of the Joint TIM Group -- AT&T, Bell Communications Research (Bellcore), Martin Marietta, Northern Telecom, and Rockwell International. The results were used to fine-tune the questionnaire before it was presented to the NSTAC Industry Executive Subcommittee (IES) in November 1986 for review and approval. The questionnaire was approved by the IES and was distributed to NSTAC member companies at that time. This questionnaire is reproduced in Appendix 6-B. Nineteen NSTAC member companies have provided responses. The Joint TIM Group staff compiled and summarized the responses in a manner that precluded the identification of particular respondents. Following an initial review of the compiled responses, a further summarization was developed, approved by the Joint Group, and distributed to the responding NSTAC companies for comment. The approved summary is Appendix 6-C.

The Joint Group then assessed the mobilization significance of the foreign-source dependent items identified by survey respondents, using additional information obtained from a variety of sources, including:

- Briefings from Government and private organizations,
- Interviews with technical consultants,
- Discussions with Department of Commerce "industry specialists",
- Review of technical literature, and
- Experience and expertise of Joint TIM Group industry and Government members.

6.3 Findings

The findings in this report fall into two categories: (1) findings based on briefings, interviews, and review of the relevant literature, and (2) findings based on the Dependence on Foreign Sources Survey responses received from the NSTAC companies, and related information from Government sources.

In-depth review of the material briefed to the Joint TIM Group or contained in documentation obtained by the Group revealed no previous or ongoing study that addressed the dependence of the telecommunications industry, as a whole, on foreign sources. However, several studies

address U.S. dependence on foreign sources for equipment and components used by the telecommunications industry. Among these are the following Department of Defense (DOD) and Department of Commerce (DOC) studies:

- Defense Science Board Semiconductor Dependency Study (1987)
- Joint Logistics Commanders' Study of Effects of Foreign Dependency (1985)
- National Defense University: U.S. Dependence on Foreign Sources for Components: The Case of Semiconductors (1983)
- Department of Commerce: A Competitive Assessment of the U.S. Semiconductor Equipment Manufacturing Industry (1985)
- Department of Commerce: A Competitive Assessment of the U.S. Fiber Optics Industry (1984)
- Department of Commerce: A Competitive Assessment of the U.S. Advanced Ceramics Industry (1984)
- Department of Commerce: A Report on the U.S. Semiconductor Industry (1979)

The first three studies listed were conducted by DOD organizations. They examine U.S. dependence on foreign sources primarily from the standpoint of equipment or components needed for military purposes. The remaining four, conducted by the DOC, are oriented toward trade and foreign competition considerations. Five of the seven listed above are concerned principally with semiconductors.

6.3.1 Dependence on Foreign-Sourced Semiconductors

Studies indicate that the nature of the dependence on foreign sources is complex. For example, a basic semiconductor device may be mass-produced in the U.S., shipped to a foreign country for the labor-intensive steps of testing and partial assembly, and then returned to the U.S. for final assembly. The device may also be produced entirely in a foreign country by means of printing masks and other equipment produced in the U.S., with the resulting component or finished equipment being ultimately returned to the U.S. Or, the device may be produced totally outside the U.S. The nature of the foreign dependency is thus related both to the type of semiconductor device and to the processing steps employed in its manufacture. The fact that a device is labeled "Made in (Nation)" does not necessarily mean that all (or, in some cases, any) production steps occurred in that nation.

The findings of the various semiconductor-related studies and documents reviewed by the Joint TIM Group and its support staff are summarized below.

Defense Science Board Semiconductor Dependency Study (1987)[7]

- The current extent of foreign dependency depends greatly on the type of semiconductor. It is very high for simple, inexpensive, mass-produced semiconductor devices and for moderately complex, mass-produced semiconductor devices with higher quality requirements. At the other end of the complexity/quality spectrum, foreign dependency is very low for highly complex, highly reliable semiconductor devices such as complex integrated circuits. This last type of component includes specialized devices proprietary to a given user or manufacturer, or devices required to meet stringent DOD specifications.

- There is a trend toward a declining U.S. technology base in semiconductor technology and production. Indicators of this trend include recent Japanese advances in supercomputers and high-speed, high-capacity memory; comparative educational trends in the U.S. and abroad; and the increasing number and advanced character of Japanese papers presented at technical symposia.

- High-capacity memory devices for U.S.-made supercomputers are obtained exclusively from Japanese firms; Japan may dominate the supercomputer market by 1990.

- The U.S. lead in market share (dollar value) of the world-wide semiconductor market was lost to Japan during 1986. Projections indicate increasing Japanese share and declining U.S. share.

The recommendations of the above-referenced report of the Task Force on Defense Semiconductor Dependency are paraphrased in abbreviated form below:

- Support the establishment of a semiconductor manufacturing technology institute . . .

- Establish eight university centers of excellence for semiconductor science and engineering . . .

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[7] Report of the Task Force on Defense Semiconductor Dependency, Office of the Undersecretary of Defense for Acquisition, Washington, D.C., February 1987. (The material summarized here is from a briefing to the NSTAC Industry Executive Subcommittee by Dr. Richard Van Atta, Institute for Defense Analyses, November 18, 1986.)

- Increase DOD funding for microelectronics research and development in semiconductor materials, devices, and manufacturing infrastructure . . .

- Provide a source of discretionary funds to the DOD's semiconductors suppliers . . .

- Establish under the DOD a Government/industry/university forum for semiconductors . . .

Joint Logistics Commanders' Study of Effects of Foreign Dependency (1985)

- At least six integrated circuits, microcircuits, and related components used in the guidance and control section of a specific precision-guided munition (the Sparrow air intercept missile) were sole-sourced to Japanese manufacturers.

National Defense University: U.S. Dependence on Foreign Sources for Components: The Case Of Semiconductors (1984)

- The U.S. semiconductor industry is threatened by competition from abroad. Some of this competition is subsidized by foreign governments.

- There is an overwhelming dependence within the United States for semiconductors processed, in some manner, offshore.

- "There is great potential for military systems to contain large amounts of semiconductors processed offshore."

- The military has no established system to track geographical origin of most of its semiconductors.

- There may be a problem with regard to mobilization caused by offshore assembly of semiconductors but DOD does not presently have the data necessary to make a definite judgement.

- 80-90 percent of semiconductors used by the military were assembled and tested outside the U.S. (This estimate is attributed to a 1980 Defense Science Board study.)

- "Most studies [in the past five years] have recognized that approximately 90 percent of the semiconductor industry's assembly capacity is located off-shore."[8]

Department of Commerce: A Report on the U.S. Semiconductor Industry (1979)

This in-depth study, now somewhat dated, recognized the declining U.S. share of the world semiconductor market and the growing participation of foreign governments in the development and support of their own semiconductor industries. The report projected that Japan's share of the U.S. semiconductor market would grow, and the U.S. semiconductor industry would face a serious challenge to its then-dominant competitive position. These projections have since been borne out, as indicated by the findings of the later studies listed above.

Two other studies have reached the following conclusions concerning materials used in making semiconductor devices:

- The U.S. is totally dependent on foreign sources for the ultra-pure silicon[9] that is required for the manufacture of certain high-reliability semiconductors. These kinds of semiconductors are currently needed for defense applications, e.g., missile guidance systems, and are becoming increasingly important for non-military applications.[10]

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[8] More recent data from the U.S. Department of Commerce indicate that shipments of semiconductors out of U.S. factories in 1985 were valued at $13.6 billion, while imports during the same period were valued at $5.7 billion. The latter figure includes semiconductors produced at U.S.-owned offshore facilities. (Private communication with industry specialists at U.S. Department of Commerce, October 13, 1987.)

[9] This term is used here to mean silicon with impurities less than one part in ten billion, which is much higher purity than ordinary semiconductor-grade silicon. In 1983, U.S. production of the semiconductor grade was 414 tons. Total use in the U.S. was 493 tons, of which 396 tons came from U.S. sources, 85 tons from Japanese sources, and 12 tons from all other sources. (Statistics provided by industry specialists at U.S. Department of Commerce, October 13, 1987.)

[10] U.S. Air Force Memorandum from Air Force Materials Laboratory, Wright Patterson AFB, Ohio, to Office of the Assistant Secretary of Defense for Installation and Logistics, SUBJECT: Strategic Silicon Stockpile. March 1977. Also, Business Week, "When the Pentagon Wants Something America Doesn't Have," October 27, 1986.

- Some degree of foreign dependency exists for gallium arsenide materials/components needed for the satellite portions of telecommunications systems.[11]

6.3.2 Dependence on Other Foreign-Sourced Equipment, Material, and Components

The Group's study of foreign-sourced materials, equipment, and components other than semiconductors was based mainly on industry responses to the NSTAC Dependence on Foreign Sources Survey, although suggestions from other sources were considered. Industry responses to the NSTAC Dependence on Foreign Sources Survey identified 21 materials, equipment items, or components for which the respondents are dependent on foreign sources. The Joint TIM Group identified six of these items for further study or monitoring.

The NSTAC survey focused on four common types of equipment:

- Digital central office switching equipment
- Fiber optic electronic terminal equipment (including repeaters)
- Telephone sets
- Satellite ground stations (including uplinks, downlinks, TT&C, and antennas)

In addition to identifying specific items, the companies were asked to indicate what effect, if any, the unavailability of these items would have on the mobilization capabilities of their company and the telecommunications industry as a whole. They were also asked to identify any other critical types of equipment (other than semiconductors) for which they depend on foreign sources.

6.3.2.1 Foreign-Sourced Equipment/Materials/Components. The 21 items identified by survey respondents as foreign source dependent are listed in Table 6-2. As a set, the items are extremely varied, ranging from specific types of moderately complex equipment (low noise amplifiers and telephone sets) to general classes of materials (silicones and ceramics). The Joint TIM Group viewed each of the items on this list as being critically foreign-source dependent to the respondents that named them.

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[11] Briefing to Joint TIM Group by Dr. Richard van Atta, July 23, 1986, on Defense Science Board Semiconductor Dependency Study and Institute for Defense Analyses Electronics Dependency Project.

TABLE 6-2
FOREIGN DEPENDENCE ITEMS IDENTIFIED IN SURVEY RESPONSES

Adhesives
Ceramics
Ceramic Reasonators
Epoxies
Ferrite Cores for Transformers and Inductors
Fiber Optic Connectors (Between the Terminal and the Fiber Cable)
Fiber Optic Terminals
Frequency Converters Associated With Low Noise Amplifiers
Hybrid Circuits Used in Fiber Optic Transmission Equipment
Klystrons
Low-Noise Amplifiers
Photodefinable Polymers
Plastic Sealed Relays
Quartz Tubes for Lightwaves
SAW (Surface Acoustic Wave) Filters
Silicones
Solder Paste
Spare Parts for Foreign-Made Assembly Equipment for Printed Circuit Boards (PCBs)
Specific-Channel Set-Top Receivers
Telephone Sets (Including Special Sets Designed for Use With Foreign-Made Switches)
Traveling Wave Tubes

The foreign dependence status of particular items was often the subject of considerable debate within the Joint Group, and questions about why a particular item had been identified by one or more respondents[12] surfaced frequently during the Group's review of the items in Table 6-2.

Detailed reasons were provided by some respondents, but no rationale was given for most of the items. The principal reasons given for foreign-source dependence were:

- No North American manufacturer of the item or acceptable substitute is known to the respondents. Although the basic item is produced domestically, component parts (other than semiconductors) are produced only by foreign manufacturers. Foreign-produced items are sometimes less expensive than the same type of items made in North America.

- Quantities of the item produced in North America are not adequate to meet respondent's demand. This problem is seen as becoming intensified during mobilization conditions when the telecommunications industry would have to compete not only with heightened levels of demand from industry and commerce, but also with demands from the military and the defense industries for available supplies of this item.

- Foreign-made versions of the item are currently embedded in respondent's network or production system. Although the same type of item is available from North American producers, there are major incompatibilities between the foreign and domestic versions that affect both normal maintenance of existing systems and expansion to meet increased levels of demand during mobilization.

Some respondents noted that their decision to buy from foreign sources was based largely on economic considerations and that they would probably buy from domestic sources if these sources became economically competitive. Others observed that declining sales of domestically-made products can lead to reduced levels of domestic production, loss of revenue, idle production capacity, and, ultimately, shut down and possible

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[12] In this discussion of survey results, attribution of information, opinions, etc., to respondents is generally made in the plural, even though the specific information may have been provided by a single respondent. This procedure is followed to preclude identification of particular respondents.

sale of production facilities. Reduced revenue often leads to lower research and development (R&D) investment, widening the gap in manufacturing technology between domestic and foreign producers -- a point also made in the Defense Science Board Semiconductor Study referred to earlier. These economic and technological trends combine to create not only a reduced domestic production capacity, but also a diminished domestic capability to produce.

As part of the Joint TIM Group's study of these items, the following types of information were considered for each item:

- Number of responding companies that identified item as potential problem
- Number of responding companies expected to use this item
- Use or application of item
- Principal concerns if foreign supplies were cut off
- Extent of problem across industry
- Are North American manufacturers identified in the survey responses?
- Do North American manufacturers exist? If so, how many are there?
- U.S. consumption data
- U.S. (and Canadian) production data
- Export-import data

This information was derived from the survey responses, follow-up contacts with some of the responding companies, interviews with "industry specialists" at the Department of Commerce and other consultants, and publications of the Bureau of the Census. The completeness of information varied substantially from one item to another.

The Joint TIM Group collectively reviewed the information available on each identified item, taking into account the impacts of a cut-off of foreign supplies during particular time periods, i.e., Short-Term (0 to 90 days), Mid-Term (90 to 180 days), and Long-Term (over 180 days). The Group explicitly recognized that the timing of specific effects would be influenced by (1) the quantities of a given item in domestic inventories/stockpiles, (2) quantities in the supply pipeline at the time of cut-off, [13] and (3) the failure-rate of the item in question.

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[13] The subject of Stockpiles and Inventories will be addressed in a separate TIM report.

For some items (e.g., telephone sets), the Group considered the possibility that idle production capacity could be brought into operation, or that foreign-designed parts could be duplicated domestically. Those approaches could be employed in the Long-Term (over 180 days), but probably could not be used effectively in the Short- and Mid-Term (0-180 days) to satisfy industry's needs. Consequently, the Group decided to focus on Pre-mobilization, Short-Term, and Mid-Term mobilization (up to 180 days).

During its review of identified foreign dependence items, the Group recognized that cut-offs of different items would have different effects not only on the time of impact, but on the nature and magnitude of the impact as well. Some items would primarily affect satellite systems; others would affect fiber optic systems. Other items would primarily affect carrier operations while still others would affect manufacturing operations.

In view of the differential effects of disruptions in the supply of various items as well as the different levels of information about the items, the Joint TIM Group classified the items into the following four categories:

- Category 1. Foreign Dependence Items Needing Priority Study:

  Item(s) in this category are sufficiently critical to warrant priority study of their continued availability to the industry.

- Category 2. Foreign Dependence Items Needing Periodic Monitoring:

  - Items in this category are critical to NSEP telecommunications. Although a substantial portion of U.S. consumption for telecommunications use is produced abroad, substantial production capacity currently exists in North America.

  - The production picture for these items is highly dynamic. U.S.-owned production facilities are being set up overseas while Japanese firms are building plants in the the U.S. The production and supply systems need to be frequently monitored to ensure that NSEP needs can be met following an interruption of foreign-made supplies.

- Category 3. Foreign Dependence Items Not Currently Needing To Be Tracked:

  Cut-off of foreign supplies of these items would affect only

limited segments of the Nation's NSEP-related telecommunications capabilities. Monitoring of supply status does not appear warranted.

- Category 4. Items Identified As Having Foreign Dependence But Lacking Adequate Data To Support Development of Conclusions:

  Items were assigned to this category when information available to the Joint TIM Group from summarized survey responses or other sources was insufficient to enable the Group to understand the basis of the item's foreign dependence status.

The distribution of items among these four categories is shown in Table 6-3 and discussed below.

Category 1. Foreign Dependence Items Needing Priority Study

Only one item was assigned to this category: Ceramic Resonators. This item was identified as an integral component of telephone sets currently being produced in the U.S. by one or more major manufacturers. The affected producers did not know of any North American sources of the item, according to the survey responses. Although some 19 U.S. firms listed as manufacturers of "acoustical transducers" produced about 5 million units in 1985,[14] the source of this information does not indicate whether any of these units are ceramic resonators, or whether they could be used as a substitute for the resonators needed for telephones. In any event, this total number of acoustic transducers produced by U.S. manufacturers is substantially less than the 23.8 million telephone sets produced in the U.S. in 1985.

While it is possible to "design around" ceramic resonators to produce an acceptable telephone set, this probably could not be accomplished during a Short-Term mobilization (up to 90 days), during which time the need to maintain an increased domestic production may be critical. In view of the key role of ceramic resonators in the production of an instrument needed in large numbers by the telecommunications industry, and the apparent high level of foreign dependence for this item, the Joint TIM Group decided that the item merited further study on a priority basis, toward the goal of reducing the industry's apparent vulnerability to a cut-off of foreign supplies of this item.

Category 2. Foreign Dependence Items Needing Periodic Monitoring

This category contains NSEP-critical items that, on the basis of available data, are believed to be substantially foreign supplied, but for which there are widely-available, domestically-produced substitutes. The

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[14] Private communication, U.S. Department of Commerce industry specialists, July 24, 1987.

TABLE 6-3
CATEGORIES OF FOREIGN DEPENDENCE ITEMS

CATEGORY 1	Foreign Dependence Items Needing Priority Study	Ceramic Resonators
CATEGORY 2	Foreign Dependence Items Needing Periodic Monitoring	Ferrite Cores Fiber Optic Terminals Fiber Optic Connectors Telephone Sets
CATEGORY 3	Foreign Dependence Items Not Currently Needing To Be Tracked	Frequency Converters Low Noise Amplifiers SAW Filters Spare Sparts For Foreign-Made Assembly Equipment For PCBs Specifc-Channel Set-Top Receivers
CATEGORY 4	Items Identified As Having Foreign Dependence But Lacking Adequate Data To Support Development Of Conclusions	Adhesives (polymeric); Ceramics; Epoxies; Hybrid Circuits For Fiber Optic Transmission Equipment; Photodefinable polymers; Quartz Tubes For Lightwaves; Silicones; Solder Paste; Klystrons; Plastic Sealed Relays; Traveling Wave Tubes

relation between imported and domestically-produced quantities fluctuates markedly for most of these items. The supply situation thus needs to be monitored frequently from an NSEP standpoint. The rationale for assigning items to this category differs from one item to another. The items, therefore, will be discussed separately.

Fiber Optic Terminals (FOTs)[15]

Fiber Optic Terminals and other parts of fiber optic transmission systems are produced by a number of large North American companies, including AT&T, Northern Telecom, and the Collins Divisions of Rockwell International. Domestic carriers reporting the use of fiber optic systems in their survey responses stated that some of their fiber optic terminals were of foreign manufacture. The proportion of foreign-made to domestic-made FOTs is not stated quantitatively by any of the respondents. Industry specialists at the Department of Commerce have provided an informal estimate that FOTs of foreign manufacture now constitute about 35 percent of the FOTs used by U.S. domestic carriers.[16]

Most respondents who reported the use of fiber optic systems also acknowledged a problem of compatibility between the fiber optic equipment of different manufacturers, citing the difficulties of integrating domestic-made terminals into systems of foreign design and manufacture. Thus, if the supply of foreign-made terminals were cut off, incompatibility could be a major problem to a carrier wishing to expand a system containing a large embedded base of foreign-made terminals.

The production and consumption patterns for this equipment item are changing. The trend toward use of fiber transmission systems in the U.S. is increasing. Also, a major foreign producer of fiber systems -- Nippon Electric Company (NEC) -- is relocating fiber optic system manufacturing facilities from Japan to Oregon. The move is significant to this study because most domestic carriers that reported the use of fiber systems also stated that they purchased a portion of their fiber optic equipment -- in some cases, the major portion -- from NEC.

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[15] The meaning attached to the terms "fiber optic terminal" and "fiber optic connector" differs from one context to another. "Fiber optic terminal" here denotes the equipment used to process and transform electrical signals to optical signals; to enter the optical signals into transmitting fiber cable; and to receive and transform optical signals to electrical signals. "Fiber optic connector" denotes here the device that connects fiber cables together, and provides the physical interface between the fiber optic terminal and the fiber cable.

[16] Personal communications, Department of Commerce industry specialists, May 22, 1987 and July 10, 1987.

Fiber Optic Connectors

In comparison with terminals, Fiber Optic Connectors are relatively simple devices. These were identified as a potentially critical foreign dependence item by respondents who use FOTs made by several manufacturers and who purchase connectors almost exclusively from foreign sources.

While standardization of connectors and many other components of fiber optic systems is far from universal, a relatively small number of connector designs fit the preponderance of terminals, whether of foreign or domestic manufacture. Department of Commerce industry specialists suggest that U.S. manufacturers produce compatible connectors for both U.S. and foreign-made terminals.[17] No data were found concerning quantities produced in North America or imported.

Telephone Sets

Telephone Sets present a complex, changing picture from the standpoint of foreign dependence. For example, U.S. consumption (Imports plus Production minus Exports) increased from 41 million sets in 1985 to 58 million in 1986. This increase partially reflects an expansion of overall telecommunications service capacity. However, it also reflects the new patterns of telephone set marketing, ownership, pricing, and use that have come about as a result of deregulation and increased competition. During the same two-year period, domestic production of sets dropped from 24 million to 18 million. Imports accounted for about 44 percent of U.S. consumption in 1985. This figure increased to 70 percent in 1986.[18] These changes are, at least in part, attributable to the transfer by U.S. firms of telephone set production from domestic plants to offshore plants.

Despite these trends, less than one-third of those respondents considered to have major requirements for telephone sets (mainly domestic and international carriers) identified telephone sets as a critical foreign dependence item. Further, none of the respondents considered to be manufacturers identified telephone sets as foreign dependence items. Some respondents gave specific reasons for not identifying telephone sets as items of concern. For example, some carriers cited their typically large inventories (120-180 days) of this item and the large amount of idle capacity in domestic manufacturing plants. The Joint TIM Group was not able to confirm the existence of this idle capacity.

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[17] Private communication, U.S. Department of Commerce industry specialists, May 22, 1987 and June 1, 1987.

[18] Private communications, U.S. Department of Commerce industry specialists, July 13, 1987.

Other respondents identified special sets designed for use with the foreign-made switches used in certain large, privately-owned or government-owned telecommunications systems or networks as a foreign dependence item. The Joint TIM Group recognized that the unavailability of special sets could affect the functioning of systems of this type.

In its review, the Joint TIM Group noted that idle production capacity may not remain in place indefinitely and that inventories vary over time. It also noted that some, if not all, major manufacturers use foreign-produced ceramic resonators in their telephone sets, and their ability to continue or rapidly expand production in the Short-Term was dependent on the availability of this component.

Ferrite Cores

Ferrite Cores are used in miniature transformers and inductors. These are, in turn, widely used in the manufacture of several types of telecommunications equipment, including central office switches, PBX equipment, and fiber optic terminals. One or more manufacturers identified ferrite cores as a foreign dependence item. One respondent noted that there is significant idle capacity for producing ferrite cores in the U.S. that could be brought into production status in about six months. Publications by the Department of Commerce show nine U.S. manufacturers of ferrite cores, but do not distinguish between makers of small cores for signal processing applications and makers of larger, heavier cores for power transformers, fractional-horsepower motors, etc.[19] The Joint TIM Group noted that, while idle production capacity may exist in North America at the time of the survey, there was no guarantee that it would be available at the time of a future mobilization.

Category 3. Foreign Dependence Items Not Currently Needing To Be Tracked

This category contains items that, in the view of the Joint TIM Group, would have only limited impact on NSEP telecommunications, particularly during the first year of a mobilization. Of the five items assigned to this category, the following four were identified by respondents because of their use in satellite earth station equipment for special-purpose private networks:

- Low Noise Amplifiers
- Frequency Converters Associated With Low-Noise Amplifiers
- Specific-Channel Set-Top Receivers
- SAW (Surface Acoustic Wave) Filters

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[19] U.S. Bureau of the Census, Current Industrial Report MA36Q(85)-1, Government Printing Office, Washington, D. C. September 1986.

Since respondents indicate that suitable substitutes for most of these items are available from North American manufacturers and that several months' supply of spare parts is typically available for the foreign made items, the Joint TIM Group determined that periodic tracking of the production/consumption/importation of these items is not needed at this time.

Spare Parts For Foreign-Made Assembly Equipment For Printed Circuit Boards is the fifth item assigned to this category. These parts are ordinarily obtained from the equipment manufacturer. No U.S. manufacturers are identified in the survey responses or by other sources of information. The Joint TIM Group concluded that the number of different types of spare parts and the diversity of their applications make the task of tracking the availability status of such parts infeasible. Moreover, the Group felt that the users of foreign-made assembly equipment would be aware of the failure rates of such equipment and would maintain an inventory of spares adequate to ensure prompt repair during extended periods of operation. Domestic job shops could duplicate spare parts if supplies from foreign sources were cut off and inventoried spares become exhausted.

Category 4. Items Identified As Having Foreign Dependence, But Lacking Adequate Data To Support Development of Conclusions

This category contains items for which the Joint TIM Group was unable to identify the basis of foreign dependence. The reasons for assigning items to this category vary from item to another.

One type of item consisted of broad classes of materials for which specific applications in the telecommunications industry are not specified by respondents. These include: Adhesives (polymeric), Ceramics, Epoxies, Photodefinable Polymers, Silicones, and Solder Paste.

The Joint TIM Group could not determine from survey responses or other available information whether the respondents' concerns were related to all types of adhesives, for example, or to specific types used for particular applications. It is also possible that the respondents were concerned about a diminishing of the domestic technology base for ceramics, while the ceramics technology abroad is advancing. Without greater specificity about respondents' concerns, the Joint TIM Group could not draw meaningful conclusions.

Another item of equipment, Quartz Tubes for Lightwaves, is assigned to Category 4 for the reasons similar to those given for the preceding group: (1) lack of specificity about the application of the item in the telecommunications industry, (2) unavailability of production, consumption, and import data, and (3) unclear basis for foreign dependence status.

In addition, there are some items -- Klystrons, Plastic Sealed Relays, and Traveling Wave Tubes -- for which available data on production, consumption, imports, and exports appear inconsistent with the status of foreign-source dependence. In the case of Klystrons, available data indicate several U.S. manufacturers whose combined production of all types of klystrons exceeds 116,000 per year. The U.S. exports about 9,500 per year and imports about 2,500.[20] In the case of Traveling Wave Tubes and Plastic-Sealed Relays, technical publications indicate that there are broad classes of equipment containing these items that are manufactured in North America. However, the information provided is not sufficiently detailed to indicate the foreign dependence status of these two specific items.

Finally, respondents state that Hybrid Circuits for Fiber Optic Transmission Equipment are available only from foreign sources. No domestic producers have been identified by other information sources. Information available to the Joint TIM Group does not indicate the reason for the apparent foreign dependence. (Industry specialists at Department of Commerce speculate that these circuits require a ceramic substrate available only from a Japanese manufacturer.)[21] This item was placed in Category 4 because of the vagueness of information concerning the basis of foreign dependence.

6.3.2.2 Other Equipment Items Recommended for Study. In addition to asking respondents to identify foreign dependence items in four major types of equipment (digital central office switches, fiber optic terminals, telephone sets, and satellite ground stations), the NSTAC survey questionnaire invited them to identify other types of equipment that should be studied as possible foreign dependence items. These are listed in Table 6-4. In discussions with the TIM Group staff, telecommunications industry specialists in the Department of Commerce also identified four foreign-sourced items for possible further study in the context of mobilization.[22] These are also listed in Table 6-4.

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[20] Types and power ranges are not specified. Possibly the identified foreign dependence status of this item relates to a U.S. need for specific types or sizes that are only produced abroad. (Data source: Electronic Foreign Trade, Electronic Industries Association, Washington D.C. December 1986)

[21] Private communication, U.S. Department of Commerce industry specialist, July 1, 1987

[22] Private communication, U.S. Department of Commerce industry specialists, July 10, 1987.

The Joint TIM Group reviewed the items from both sources and agreed to record the suggested items in this report. However, the Group decided not to undertake further study of these items.

6.3.3 Potential Remedial Measures

The NSTAC Survey invited respondents to identify steps that government and/or industry might take to mitigate, reduce, or eliminate any adverse effects on the telecommunications industry's ability to mobilize effectively, and to sustain a long-Term mobilization effort (beyond six months). Some of the responses are summarized below:

- Maintain a database of equipment, materials, and components, showing manufacturers and alternate sources.
- Promote construction/operation of foreign-owned plants in the U.S. Encourage North American investment in manufacture of critical items, possibly as joint ventures.
- Monitor trends in the production, consumption, and importation of critical items.
- Encourage domestic manufacturing, research, and development by removing manufacturing restrictions on certain U.S. companies.
- Use non-foreign-source dependent facilities for NSEP services. Incorporate "Buy American" clauses in industry/Government contracts.
- Develop and maintain mobilization contingency plans.
- Stockpile critical items not obtainable from U.S. or Canadian sources.
- Develop multiple sourcing agreements.
- Prohibit or control dumping of critical telecommunications components.
- Increase dialogue among Government, industry, labor, academia, and other interested parties.
- Improve national ability to redeploy labor affected by changing markets and technologies.
- Make trade a national priority and give greater emphasis to trade policy and policy-making. Create a Department of Trade.

TABLE 6-4
OTHER POTENTIAL FOREIGN SOURCE DEPENDENCE ITEMS

NSTAC SURVEY RESPONSES

Analog Switching and Carrier Systems

Cellular Radio/Telephone

Computers and Peripherals

Gallium Arsenide Field Effect Transistors (GaAs FETs)

HF Radio Equipment

High Speed Modems

Large Satellite Communications Antennas

Matrix Switching Equipment

Microwave Radio

Multiplexing Equipment

Non-Electronic Equipment Needed To Support Telecommunications Equipment, Such As Power Generators and Switch Gear; Steel Towers; Heating, Ventilating, and Air Conditioning Equipment; and Fire Suppression Systems

Private Radio Carrier Systems (Such As Used By Pipelines and Power Companies)

Terrestrial Microwave Equipment

Test Equipment

DEPARTMENT OF COMMERCE SUGGESTIONS

Crossfield Amplifiers

Gallium Arsenide Field Effect Transistors (GaAs FETs)

Microwave/Millimeterwave Monolithic Integrated Circuits

Solid State Power Amplifiers (SSPAs)

While the survey instructions clearly stated that the Joint TIM Group's primary interest was mobilization rather than the trade or economic implications of foreign dependency, several of the responses have served to emphasize the strong and complex interrelationships between telecommunications industry economics and foreign sourcing. For example, some respondents noted that one reason U.S. companies buy from foreign sources is price advantage, and that the competition among several foreign and domestic sources for the same market tends to minimize the cost of fielding new facilities and capabilities. The stimulation of technological development provided by this diverse competition was also mentioned. These points are consistent with the views expressed in the briefing to the Group by an official of the American Electronics Association (AEA) concerning the need to bring U.S. economic, trade, and foreign policy into closer alignment, toward the goal of restoring U.S. industry to a position of global leadership, thereby increasing the Nation's economic strength and national security.[23]

6.4 Conclusions

In drawing conclusions from the information it had assembled, the Joint TIM Group recognized that technological advances, trends toward increasing consumption, and the changing patterns of domestic production versus imports all suggest that there is no one set of critical foreign-sourced items that can be stockpiled or domestically-produced to protect against shortages during mobilization. Today's critical item may be obsolete in a few months, while important segments of today's domestic production capabilities may be shifted offshore next year. A process or mechanism is thus needed for monitoring technological developments, as well as production/consumption/importation trends, and for interpreting these trends toward the goal of ensuring that NSEP needs can be met in the event that foreign supplies are cut off.

In identifying dependence on foreign sources as a subject warranting further study, the original NSTAC TIM Task Force stated:

> The increasing dependence of the telecommunications industry on foreign sources raises significant questions about the industry's ability to respond to and sustain mobilization requirements.[24]

In addressing this concern, the Joint TIM Group has reached the following conclusions on the basis of briefings received, reports reviewed, and

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[23] A briefing on international competitiveness was presented to the Joint TIM Group by Stephen R. Levy, President, American Electronics Association, on November 19, 1986.

[24] Final Report of the TIM Task Force, Volume I, page 10.

responses to the NSTAC Dependence on Foreign Source Survey.

(1) Semiconductors

(a) At this time, if foreign-sourced semiconductors became unavailable, it would not have significant impact upon the provision of telecommunications service during Short-Term (0 to 90 days) and Mid-Term (0 to 90 days) mobilization. While production of telecommunications equipment would be adversely affected in the Short- and Mid-Term, available equipment could be allocated to meet mobilization-related national security emergency preparedness (NSEP) needs.

(b) At this time, to the extent that foreign-sourced semiconductors became unavailable, expansion of telecommunications service capacity would be constrained during Short- and Mid-Term mobilization, and overall capacity would be reduced in the Long-Term because the telecommunications industry would be competing with other entities (e.g., the Department of Defense) for the allocation of available supplies.

(2) Equipment, Materials, and Components Other Than Semiconductors

(a) In the Short-Term and Mid-Term, the service sector of the U.S. telecommunications industry would not be immediately or severely affected by disruption of the supply of foreign items. Adverse effects would be felt as foreign equipment fails or requires repair parts.

(b) The manufacturing sector of the U.S. telecommunications industry could be immediately affected by a cut-off of critical foreign-sourced supplies, equipment, or materials. The timing of effects on production would depend, in part, on the quantities of foreign-sourced items in domestic inventories and in the supply pipeline.

(c) The U.S. industry's foreign dependence presents a changing picture in terms of the specific equipment, components, and materials for which dependency exists as well as the degree of dependence for each. Today's list is different from last year's, and next year's will differ from today's. The following conclusions and observations reflect the current picture as drawn by the NSTAC Foreign Dependence Survey and related studies:

- In view of the large number of foreign-made fiber optic terminals embedded in U.S. telecommunications systems (about 35 percent foreign according to some estimates) and the inherent incompatibility between terminals made by different manufacturers, foreign-made terminals and their interfacing connectors could become a problem if maintenance or expanded capacity is required.

- The U.S. currently imports over 60 percent of the telephone sets it uses. Although the demand for telephone sets during mobilization is not known, the fact that imports have risen to this level suggests that telephone sets could be a problem during mobilization. Therefore, the Joint TIM Group concluded that domestic production and import status of this item should be periodically monitored.

- The foreign dependence status of the ceramic resonators should be studied in depth, with a view toward identifying possible steps to reduce the degree of foreign dependence. The availability status of four other critical items -- fiber optic terminals, fiber optic connectors, telephone sets, and ferrite cores--should be periodically monitored for the same purpose.

6.5 Recommendations

On the basis of its conclusions regarding the impact of semiconductor foreign dependency on the telecommunications industry, the Joint TIM Group offered the following recommendation:

- Semiconductors are major components of the equipment used by the telecommunications industry, and the industry is almost totally dependent on foreign-sourced semiconductors. Accordingly, the ongoing National Security Council and Defense Science Board efforts in this area are strongly supported. The President should direct action to identify steps to mitigate the impact of the loss of foreign-sourced semiconductors on the telecommunications industry.

Further, on the basis of its collective assessment of the responses to the NSTAC-wide Telecommunications Industry Dependence on Foreign Sources Survey, the Joint Group has identified other dependencies of concern from a mobilization perspective. While these dependencies may not have the same wide-ranging significance to the telecommunications industry as semiconductors, they are important. Accordingly, the Joint TIM Group offers the following recommendations:

- The Government, in conjunction with the NSTAC, should establish a mechanism to periodically assess industry dependence on foreign sources in light of identified Government mobilization needs.

- The NCS and NSTAC should jointly keep the Executive Office of the President (EOP) apprised of any specific foreign dependency issues relating to telecommunications, and identify, if necessary, possible measures for reducing or mitigating these foreign dependencies.

- In conjunction with the above Government action, the NSTAC member firms should ensure that their appropriate internal organizations are made aware of the findings of the joint TIM Group. Further, these internal organizations should be apprised of the need to plan for contingencies such as a cut-off of non-North American supplied material during a mobilization.

APPENDIX 6-A

ANNOTATED BIBLIOGRAPHY ON FOREIGN DEPENDENCY IN TELECOMMUNICATIONS

ANNOTATED BIBLIOGRAPHY

Alexander, Arthur J. and Hong W. Tan (September 1984), Barriers to U.S. Service Trade in Japan, Rand Corporation, Santa Monica, CA.

This study identifies and describes barriers to trade in Japan that are believed to exist in six service areas. Case studies are provided for the six areas: banking and securities; insurance; law; accounting; data communications; and advertising. Within these case studies, several possible hypotheses are developed about the sources of impediments in Japan to U.S. service trade, with the emphasis on "non-market" impediments to trade--especially those barriers derived from government policies. Information for the case studies was derived primarily from interviews with representatives of American and Japanese firms and from interviews with Japanese government officials with regulatory and supervisory responsibilities.

Auerbach, Stuart (March 1986), "Japan Found Dumping Chips", Washington Post.

This brief article reports on the Department of Commerce accusing Japan of unfair trading practices. The Japanese were blamed for dumping chips in the U.S. at prices below production costs and of blocking the access to their domestic market. These events point to the intense competition between these countries' semiconductor industries. The article cites semiconductors as a "key element of computers and telecommunications systems."

Auerbach, Stuart (January 4, 1987), "Chip Makers Seek Funds for Proving Ground", Washington Post.

U.S. semiconductor manufacturers are formulating a project called "Sematech" in an effort designed to regain world leadership in the advanced computer chip market. The project, to be financed equally by the Pentagon and industry, would set up a model production facility for fabricating chips with higher reliability and lower cost and would improve competitiveness in the world market.

Bement, Arden L., Jr. (1985), "Materials Sector Profile", Technological Frontiers and Foreign Relations, Washington, DC: National Academy Press, pp. 110-164.

The 54-page article surveys advances in materials technology (e.g., synthetic polymers, rubbers, plastics, modified bioorganic substances), forecasts their future applications, and assesses the impact of these developments on U.S. foreign relations and on the Federal Government's management of the strategic materials stockpile. Technological expertise for producing these materials resides in the West (i.e., U.S., Great Britain, France, and West Germany) and Japan, and nations are investing heavily in their high-technology materials development programs. This will lead to greater interdependence and fiercer competition in the marketplace. The author, Vice President for Technical Resources at TRW, says that for the U.S. to be a viable competitor in the materials marketplace and to avoid being overly dependent on offshore sources of these materials, the nation's foreign and domestic economic policy must be adjusted. Moreover, if the nation's stockpile is to be maintained without obsolete strategic materials, stockpile management must be more effective. The author provides numerous conclusions, e.g., because "industry is the major ultimate supplier and user of strategic materials and will control the rate of introduction of substitutes for strategic materials," it should have "sustained . . . policy advisory and review roles" in the critical materials sector.

Borky, John M. et al. (March 1985), Surge Capability of the Defense Electronics Industry, Washington, DC: Industrial College of the Armed Forces, National Defense University.

Prepared by students at the Industrial College of the Armed Forces (ICAF), this research report addresses the ability of the defense electronics industry to support increased production of tactical weapons in a "non-war" economy. Three weapons systems--the APG-66 radar, the AN/UYS Signal processor, and night vision goggles--were studied to identify surge limiters and to assess the overall health and surge capability of the industry. Based on these case studies, the researchers concluded that the industry can support only a limited surge program due to capacity saturation at the subcontractor/supplier level, the concentration of defense programs, existing administrative and business practices, and the lack of necessary plans and priorities. Recommendations for the improvement of surge capabilities are offered in the report, including the provision of adequate funding, the correction of poor business practices, the development of surge plans and priority lists, the integration of surge preparation and program management, and the improvement of productivity and stockpile/inventory levels.

Botwin, Brad and John Tucker (August 1986), Industrial Capabilities Program, a briefing prepared by the Office of Industrial Response Administration, U.S. Department of Commerce.

This briefing describes the mission, organization, and programs of the Office of Industrial Resource Administration. Special emphasis is placed on the industrial capabilities program in which economic factors are examined for select industries for the periods of peacetime, surge, and mobilization. Information sources used in the industrial capabilities program are identified, and a list is provided on the types of economic data provided in the program. Completed studies under the program which would be of special interest to the Joint TIM Group include those concerning klystrons and travelling wave tubes. A study of the ceramic capacitor industry is also of interest to the Joint TIM Group but was not completed as of August 1986.

Bradford, Hazel and Evert Clark (October 27, 1986), "When the Pentagon Wants Something America Doesn't Have", Business Week, p. 46.

This article discusses the U.S.'s total dependency on foreign sources for the super-pure silicon necessary for manufacturing high-reliability semiconductors used in both defense and non-military applications. To assure a domestic supply, the DOD plans to reactivate the 1950 Defense Production Act and offer U.S. companies guarantees to purchase $8 million worth of super-pure silicon. However, reaction from manufacturers has been cool, due to the high cost of doing military work that may have limited market prospects. The Pentagon argues that such purchase guarantees will open up new markets.

Caccamise, Richard J. and John S. Fitzgerald (March 1983), U.S. Dependency on Foreign Sources for Components: The Case of Semiconductors, Washington, DC: Industrial College of the Armed Forces, National Defense University.

This study assesses the foreign dependency of the military resulting from the use of semiconductors that are manufactured totally or in part off-shore. The impact of the foreign dependency on military mobilization is also examined. Information gathered in the study confirmed that most semiconductors used by the military have a high potential for being manufactured off-shore; however, the absence of a DOD information system precludes determining the extent of the dependency with certainty. Specific recommendations are provided for DOD future action.

"Ceramics as Engineering Materials", (February 18, 1985), Design News, pp. 70-78.

In the future, ceramics will be used more often for commercial applications in electronic and optical devices. The ceramics industry in the U.S. is steadily growing. One forecast has U.S. shipments of advanced ceramic parts reaching the $10 billion mark by the year 2000.

Clark, Joel P. and Frank R. Field (August/September 1985), "How Critical Are Critical Materials?", Technology Review, 88:6, pp. 38-47.

The authors point out that U.S. dependency on foreign sources for critical strategic materials is a manageable problem. Substitute materials, such as ceramics and plastics, or lower grade materials acquired from alternate foreign sources or domestic sources, can offset shortfalls arising from a primary foreign source cutoff. Moreover, the authors say that the historical record of embargoes indicates that "a complete shutoff of critical materials is slim."

Department of Commerce (October 22, 1984), News Release on the U.S. Ceramics Industry, Washington, DC.

The DOC stated that advanced ceramics can reduce U.S. dependence on foreign sources for critical strategic materials. Multilayer capacitors and integrated optical devices were cited as two of the five applications for these advanced ceramics.

Department of Commerce (January 1986), 1986 U.S. Industrial Outlook, Washington, DC.

Recent performance and forecast statistical data is provided in the publication for the following industries of interest to the Joint TIM Group: (1) radio and television communication equipment, (2) telephone and telegraph equipment, (3) telephone and telegraph services, and (4) electric components. Additional references are also provided in the publication for the subject industries.

Department of Commerce, Bureau of the Census (March 1985), 1982 Census of Manufacturers Industry Series: Communication Equipment Including Radio and TV, Washington, DC.

This publication provides detailed statistics on the subject industry, the products of the industry, and the materials consumed by the industry for 1982 and earlier years.

Department of Commerce, Bureau of the Census (August 1985), Current Industrial Report in "Selected Electronic and Associated Products, Including Telephone and Telegraph Apparatus", Washington, DC.

This 33-page, largely tabular, report presents the results of a 1984 survey of selected electronic and associated products, including telephone and telegraph apparatus (product codes ranging selectively from 36611 through 39447) revealed that the value of telephone switching and switchboard equipment in 1984 was $5.5331 billion, an increase of 19 percent from 1983; other telephone and telegraph equipment were valued at $8.1479 billion, an increase of 20 percent from 1983. These two categories of telephone- and telegraph-related equipment are subdivided into 15 and 33 more detailed categories of equipment described in terms of the number of producer companies, quantities produced, and dollar value. One interesting but only approximate result was that the percentage of the dollar value of equipment consumed domestically deriving from imports increased for both categories between 1983 and 1984 (from 7 to 11 percent and 14 to 15 percent, respectively). Lack of data in the report for years prior to 1983 does not allow a determination of whether this one year's increase is part of an upward trend in important equipment for these two categories.

Department of Commerce, Industry and Trade Administration (September 1979), A Report on the U.S. Semiconductor Industry, Washington, DC.

This 132-page report provides an overview of the U.S. semiconductor industry at the end of the 1970s. It outlines technological and economic developments, domestic and worldwide, that have influenced the shape of the semiconductor industry and the role of semiconductors in the overall electronics industry. The report describes the cost structure of the industry, including the prominent role of R&D and the labor-intensive nature of assembly. Changing patterns of exports and imports are described; implications of joint government-industry programs such as Japan's Very-Large-Scale Integrated Circuit (VLSI) Program are discussed, as well as other trends expected to affect the course of the industry during the 1980s. The technology of semiconductor manufacturing and product development is described in a 25-page appendix.

Department of Commerce, International Trade Administration (February 1983), An Assessment of U.S. Competitiveness in High Technology Industries, Washington, DC.

This broad assessment of U.S. competitiveness in high technology industries describes two sectors of importance to the telecommunications industry: semiconductors and fiber optics. The major technological challenge to the United States in both sectors is from Japan. In semiconductor technology, Japan is taking the lead in both metal oxide semiconductors (MOS) and in complementary metal-oxide semiconductor (CM-OS). Japan's emerging semiconductor production equipment technology will soon rival U.S. capabilities. In the fiber optics area, Japan has been credited with a clear lead in one of the three components necessary for a fiber optic system (the light source technology) and is competitive to the U.S. in the other two components (transmission medium and detectors). Furthermore, Japan's Ministry of International Trade and Industry has targeted opto-electronics for rapid development. While not explicit in the report, one possible implication of these findings is that the healthy U.S. industries in these sectors could be adversely affected by tough competition from Japan, perhaps forcing telecommunications equipment manufacturers to become even more dependent on Japan for supplies of semiconductor and fiber optic components.

Department of Commerce, International Trade Administration (April 1983), High Technology Industries: Profiles and Outlooks--The Telecommunications Industry, Washington, DC.

This overview-type document presents an industry profile designed to assess the telecommunications industry's international competitive position, identifies competitive issues, and presents options to address these issues. It gives annual value of products of leading equipment-producing nations (for 1981), and indicates regional shares of the world telecommunications market in 1977, 1982, and 1987 (projected). It presents product line share of world sales in 1982 for switching (3 categories comprising 34 percent of total), transmission (4 categories comprising 33 percent), terminals (4 categories comprising 13 percent), mobile radios (8 percent), private systems (8 percent), and other types of equipment (less than 5 percent). It tabulates the value of exports and imports (SIC 3661) for ten principal producer nations for 1977 and 1981, and aggregate trends in U.S. telecommunications equipment trade (exports and imports) for 1972 and 1977, and annually for 1979-1983.

Department of Commerce, International Trade Administration (September 1984), A Competitive Assessment of the U.S. Fiber Optics Industry, Washington, DC.

The competitiveness of the U.S. fiber optics industry is assessed in terms of world and domestic market structures and accessibility, R&D (which is a major cost component of the industry) production and cost structure, and policy constraints. In light of the scarcity of official statistics, yearly estimates are presented for the dollar volume of the U.S. and world fiber optics market for the years 1981 through 1989, during which time both markets are expected to increase by an order of magnitude. U.S. government budgets and R&D operational costs of fiber optics are presented for major defense agencies and civil agencies for the years 1983 through 1986. The U.S. demand for fiber optics technology and its production capacity (by firm) are discussed. The report states that telecommunications applications account for 80 percent of the present fiber optic market (worldwide), and presents 1982 sales for the 16 leading telecommunications equipment companies. Recommendations are made to the fiber optics industry and to the U.S. industry.

Department of Commerce, International Trade Administration (March 1985), A Competitive Assessment of the U.S. Semiconductor Manufacturing Equipment Industry, Washington, DC.

This 110-page report sketches the development of the Semiconductor Manufacturing Equipment (SME) industry, and assesses the competitive position of U.S. SME industry in the world market. The report describes the relationship of the SME industry and the semiconductor industry, and presents historical trends as well as future projections (expressed in dollar value per year) for both semiconductor production and SME demand. Data of this nature is presented separately for major producing regions (U.S., Japan, and Europe). The structure of the SME industry within each of these regions is described, and examples given of the competitive strengths and weakness of the industry within each region. The report presents policy options for both government and industry that might be used to improve the competitive position of the U.S. SME industry in the world market.

Department of Commerce, National Telecommunications and Information Administration (July 1985), Issues in Domestic Telecommunications: Directions for National Policy, Washington, DC.

This 185-page report presents an in-depth description of major regulatory, structural, and technological changes that have profoundly affected the U.S. telecomunications industry since the mid-1970s. Separate chapters address (1) technology, (2) structural elements and other constraints in the telecommunications industry, (3) long-term viability of interexchange competition, (4) Federal/state jurisdiction, (5) depreciation and capital recovery, (6) meeting telecommunications goals in rural America, and (7) trade implications of domestic telecommunications policy. Recommendations and solutions to problems in certain of these subject areas are presented.

Department of Commerce, Office of Industrial Resource Administration (July 3, 1986), National Security Assessment of Critical Gas Turbine Engine Subcontractors, Washington, DC.

This document is intended to survey the critical parts and components suppliers of the gas turbine engine manufacturing industry for information related to their defense production capabilities. As such, the document is applicable to foreign source dependency because of the form of its questions rather than the content, which concerns parts and component suppliers for the telecommunications industry. The document consists of a letter of transmittal addressed generically to the "Gas Turbine Engine Subcontractor Industry" dated July 3, 1986. The letter requests responses from the industry by August 6, 1986 on the enclosed survey form. The survey form, entitled "National Security Assessment of Critical Gas Turbine Engine Subcontractor," (form ITA-9054) is divided into four parts: Part I, Firm Identification; Part II, Peacetime, Surge Production, and Mobilization Production Capacity; Part III, Investment, R&D, Government Programs (etc.); and Part IV, Foreign Relationships/Foreign Sources. Part IV of the form could be used with little change to survey foreign source dependency within the telecommunications supplier industry.

Department of Commerce, Office of Industry Assessment, Industry Analysis Division (March 1984), A Competitive Assessment of the U.S. Advanced Ceramics Industry, Washington, DC.

This assessment concerns new ceramic materials and products that have been developed over the last 30 years. These advanced ceramics have special hardness/strength, thermal, and electrical properties, and are intended for use in high-performance engines,

machines/devices, and electronic components. The advanced ceramic industry described in the assessment encompasses two principal businesses--electronic components and engineering products. The assessment concludes that there is no clear indication that either Japan or the United States has a general technological lead over the other in advanced engineering ceramics. However, the assessment concludes that if things continue as they are now, the United States will fall behind Japan in the field of advanced engineering ceramics. National implications of the assessment and Federal options to strengthen the competitive position of the U.S. advanced ceramics industry are also discussed in the assessment.

Department of Commerce, Office of Trade and Investment Analysis (November 1985), U.S. Foreign Trade Highlights: January-September 1985, Washington, DC.

This publication presents a third-quarter review report for Calendar Year 1985 concerning U.S. merchandise trade with major trading partners and regions. It consists predominantly of data tables and graphs. Trade data is broken down by commodity category for leading items and regions of the world. Telecommunications equipment (Schedule E Number 764) is a leading trade item for many regions of the world. The telecommunications trade data presented in this quarterly report permits a number of interesting statistical results to be derived. All the following results are for the January-September 1984 and/or 1985 periods. The total dollar value[1] of U.S. telecommunications equipment imports exceeded exports by 80 percent and 77 percent for 1984 and 1985, respectively. For both of these years, nearly two-thirds of the imports came from developed countries, including Japan. Indeed, imports from Japan constituted approximately 49 percent in 1984 and 52 percent in 1985 of total U.S. world imports in the telecommunications equipment category. (The apparent increase between 1984 and 1985 may be due only to price inflation.) Finally, it is worth noting that telecommunications equipment is not a leading item for trade with the Centrally Planned Economy countries (e.g., USSR, China, Eastern Europe). In conclusion, this publication provides useful data (on a quarterly review basis) on telecommunications equipment trade from which trends ultimately may be discovered.

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[1]Dollar values of U.S. exports are expressed in F.A.S. value, while imports are valued on a Cicif basis. Trade balances are nevertheless computed by taking the difference between imports and exports.

Department of Defense, Office of the Assistant Secretary of Defense (A&L) (1985), An Industrial Mobilization Handbook for Industry, Washington, DC.

This handbook provides an introduction to the Federal government's industrial preparedness program, describing existing plans, systems, authorities, and procedures for planning and implementing industrial surge and mobilization. The legal basis for industrial surge or mobilization is outlined, and organizational roles and responsibilities are defined. Separate sections address "Contracting," "Facilities and Equipment," and "Materials." Industrial surge or mobilization planning, pre-implementation actions, and implementation of surge and mobilization plans are also discussed.

Department of Defense, Office of the Assistant Secretary of Defense (A&L) (1985), Industrial Mobilization Handbook for Government, Washington, DC.

See previous entry.

Drucker, Peter F. (Spring 1986), "The Changed World Economy", Foreign Affairs, 64:4, pp. 768-791.

The author's theme is that "the world economy is in control, rather than the macroeconomics of the nation-state on which most economic theory still exclusively focuses." The world is more economically interdependent today than ever before and adjustment to that fact will improve a nation's competitive position in the global marketplace. The author makes the point that the decreasing demand for raw materials worldwide is due in part to the declining need for them by high-technology industry. For example, raw materials account for only one to three percent of the production cost of a semiconductor microchip. Another interesting point the author makes is that the emergence of automation is contributing to the decline of the blue collar labor force in the industrial nations. Related to this is the following insight: "Some American semiconductor companies have lower labor costs because they do the labor-intensive work offshore, e.g., in West Africa, but they are still the high-cost producers and easily underbid by the heavily automated Japanese."

"Executives Cite Erosion of Defense Industry Base" (November 24, 1986), Aviation Week and Space Technology, pp. 68-69.

The Defense Public Advisory Committee (DPACT), composed of chief executives from major defense firms, concluded that the U.S. industrial base has been eroded by economic trends and U.S. Government policies and that U.S. military forces would be inadequately supported in a major conflict. The article discusses those policies and regulations which DPACT feels have contributed to the weakening of the defense industrial base and outlines suggested safeguards.

Finan, William F. and Chris B. Amundsen (May 30, 1985), An Analysis of the Effects of Targeting on the Competitiveness of the U.S. Semiconductor Industry, a study prepared for the Office of the U.S. Special Trade Representative, Department of Commerce and Department of Labor, Washington, DC.

This study quantifies the effects of industrial targeting practices on the competitiveness of the U.S. semiconductor industry. An economic model was used to assess market performance and to determine the incremental effects on market position attributable to targeting practices.

Fitzgerald, Edmund B., Chairman, Northern Telecom, Inc. (September 12, 1985), Testimony before the U.S. Senate Subcommittee on International Trade, Washington, DC: Government Printing Office.

Mr. Fitzgerald expressed support of the objective of global open market access, stating that Northern Telecom would benefit from worldwide open market access as much as any company on earth. He contended, however, that a fully open trading system cannot be based on attempts to achieve balanced trade by product sector only. He stated the need for a two-tiered national strategy. The first tier would be a proactive U.S. business community dedicated to opening global markets and willing to commit sufficient company resources and marketing efforts to the global marketplace. The second tier would be a proactive government committed to an aggressive open market negotiating strategy and to domestic policies that provide incentives to domestic producers willing to aggressively sell their products in the international market.

Green, Anthony T. (1986), U.S.-Japan Technology Transfer: Accommodating Different Interests, Cambridge, MA: Harvard University Center for Information Policy Research.

This study addresses two major issues relating to the transfer of computers and computer software technology between the U.S. and Japan. The first of these issues concerns U.S. national interest. When is technology transfer in the national interest, and when more than one U.S. national interest is involved, how should the U.S. prioritize or achieve the right balance among policies affecting technology transfer? The second issue is this: Are the U.S. Government and business communities adequately prepared to deal with issues affecting or affected by the U.S.-Japan technology transfer now and in the future? Options for U.S. policy are discussed, as well as the implications for pursuing some of the options.

Hayashi, Alden M. (February 15, 1986), "U.S. IC Start-Ups Turn to Japan for Manufacturing", Electronic Business, p. 32.

A trend in the Integrated Circuit (IC) industry is the forming of partnerships between U.S. and Japanese firms. The U.S. possesses the technological expertise and Japan will risk start-up investments. A long-term danger is that the Japanese will eventually acquire the technologies. To avert a technology gap and an eroding market share, some U.S. manufacturers are seeking out IC start-ups.

"Japan Drops Some Barriers to Communications Trade" (August 20, 1986), Washington Post.

Negotiations over the sale of telecommunications equipment and service by foreign companies have removed some of the administration barriers to U.S. firms' access to the Japanese market. The article reports that 174 types of foreign terminal equipment had been approved for sale in Japan, of which 103 were American. However, the approval for Japanese companies to buy foreign telecommunications satellites has the largest potential impact in monetary terms.

Morgan, Dr. John D. (May 22-23, 1986), The Defense Production Act, Fifth Annual Mobilization Conference, Washington, DC: Industrial College of the Armed Forces, National Defense University.

This paper describes the Defense Production Act, reviewing the purpose, principal provisions, and application of the Act since its original passage in 1950.

National Research Council, Board on Telecommunications-Computer Applications, Commission on Engineering and Technical Systems (February 1983), National Joint Planning for Reliable Emergency Communications, Washington, DC.

This report to the National Communications System (NCS) discusses the need for national industry and Government planning for emergency communications and the issues associated with such planning. The current commercial environment and its implications for the NCS and national security emergency preparedness are described, including the likely effects of judicial and regulatory decisions. The nature and potential use of communications satellite and cable television-based communications services for national security and emergency preparedness purposes are also examined.

"Protection of Critical Metals Supply Probed" (January 28, 1985), Chemical and Engineering News, p. 29.

The article summarizes an Office of Technology Assessment (OTA) report on reducing U.S. dependence on foreign sources of strategic materials. OTA cited alternate foreign sources, recycling, and substitution as methods to reduce the need from abroad. OTA recommended that the Government provide financial assistance to encourage the development of domestic programs to alleviate this dependence, e.g., new scrap metal recycling technologies.

Robertson, Jack (June 9, 1986), "Marietta Head: All Industries Affected by IC Retrenchment", Electronic News, p. 14.

This is a report on public comments about the state of the U.S. semiconductor industry made by Mr. Norman Augustine, president of Martin Marietta Corporation and chairman of the Defense Science Board Task Force on U.S. Semiconductor Dependency. He said that the high capital expenditure, the prevalent desire for quick returns on investments, stringent antitrust laws, and a dearth of quality engineers contribute to the stunted development of the American semiconductor industry.

Robertson, Jack (December 8, 1986), "DOD Task Force Urges $1.7B for Five-Year Semicon Thrust", Electronic News, p. 1.

This article discusses a "Defense Semiconductor Initiative" proposed by a Defense Science Board Task Force on Semiconductors.

This initiative would support an industry consortium to produce next-generation DRAMS, with an appropropriation of $1.7 billion over a five-year period. The panel report stresses the importance of restoring U.S. leadership in the semiconductor market.

Schrage, Michael (March 1986), "U.S. Dependence on Japan for Parts Worries Pentagon", Washington Post.

Mr. Schrage cites DOD concerns that weapons systems rely heavily on Japanese technology even to the extent that "in some cases . . . you either buy from Japan or you don't get it," as stated by an official from the Defense Advanced Research Projects Agency (DARPA). The House Armed Services subcommittee staff estimated that 80 percent of DOD's silicon chips are manufactured in Asia. The article pointed out that three high-level committees were studying this issue: the Defense Science Board Task Force on U.S. Semiconductor Dependency, a panel consisting of DOD's joint logistics commanders, and a National Academy of Science Electronics Components Committee.

Semiconductor Industry Association (1985), 1985-1986 Yearbook and Directory, San Jose, CA.

This annual report of the Semiconductor Industry Association provides information on the organization of the association, programs sponsored by the association, relevant industry trade statistics, and a directory of association members. Information is also provided on other publications of this association.

Semiconductor Industry Association (Spring 1986), "SIA Circuit", Semiconductor Industry Association Newsletter, 8:1.

This issue of the newsletter provides a summary of the U.S. semiconductor industry's allegations of unfair or illegal trade practices by Japan and its semiconductor manufacturers.

Socolovsky, Alberto (January 1, 1986), "Forecast for U.S. OEM Electronic Component Purchases", Electronic Business, p. 96.

This brief article summarizes the trends in electronic component purchases by original equipment manufacturers (OEMs). Purchases rose steadily from 1984 through 1985, and they are expected to continue rising in 1986. Moreover, there will be more purchases of imported components (capacitors, connectors, inductors, keyboards, resistors, and semiconductors).

Socolovsky, Alberto (April 15, 1986), "Communication Equipment Acquires A Foreign Accent", Electronic Business, p. 17.

U.S. expenditures on non-defense communications equipment (answering machines, data communications, facsimile, local area networks, mobile radios, network functions, switching and transmission equipment, and telephone sets) will increase from $21 billion in 1985 to $27.3 billion in 1987. Importation of this gear will increase also, with Japan and Korea as the major sources.

SRI International (January 1982), The Emerging Impact of Foreign Competition on National Security and Emergency Preparedness Telecommunications--Annex B, Arlington, VA.

This study provides a pre-divestiture view of the impact of foreign competition on telecommunications. It presents a great deal of data relating GNP, patenting activity, production, and investment. It also discusses trade barriers and the Multilateral Trade Negotiations.

SRI International (July 1982), Optical Communications Systems: A Case Study on Protection of the U.S. Mobilization Base, Arlington, VA.

In 1980, the FCC ordered AT&T to use competitive bidding for a leg of its new fiber optic cable being installed along the Northeast Corridor. The low bidder was Fujitsu. This study examines the resulting debate over the national security implications of awarding such a contract to a foreign firm. It includes a review of the technical characteristics of fiber, a description of the tension between deregulation and national security, and proposed policies for recognizing similar situations at an earlier stage in the future.

Standard and Poor's Corporation (November 1, 1984), Industry Surveys: Telecommunications, Current Analysis, 152:44, Sec. 1.

This publication provides a detailed overview assessment of the telecommunications industry for 1984--the first year of transition of the industry from a regulated utility to a competitive business. Projections are provided for the industry, as well as financial and market information for 1984. General information articles are also provided in the publication concerning the outlook for the industry, regulation and pricing, telephone services, equipment, composite industry data, and comparative company analysis.

"U.S. Market Report: Semiconductors" (January 6, 1986), Electronics, pp. 53-55.

This 1986 market forecast for semiconductors provides an interesting view of the semiconductor economy. For example, semiconductor shortages in 1983 prompted the Integrated Circuit (IC) industry to step up production and compelled equipment firms to stock up. A depressed personal computer market in 1985 contributed to an emerging IC glut. Moreover, throughout 1985, the U.S. and Japan waged a price-slashing campaign against each other. Astute buyers waited for the bargain prices. Chips for communications equipment, however, were an exception to the rule as demand increased by 17 percent. One market projection has communications ICs maintaining a 30 percent annual growth rate in demand through the remainder of the 1980s.

Verner, Liipfert, Bernhard, McPherson and Hand (April 5, 1985), The Impact of Japanese Market Barriers in Microelectronics: An Analysis Prepared for the Joint Economic Committee on Economic Goals and Intergovernmental Policy, Semiconductor Industry Association, San Jose, CA.

This study provides an assessment of market barriers that U.S. semiconductor companies have encountered in Japan during the past two decades. The barriers include both formal Government protective measures and a market structure that is resistant to foreign products. Estimates are provided on the cost to the U.S. of Japanese market barriers. The importance of the U.S. market position is also reviewed in terms of continuing expansion of capacity in Japan and the possibility of future sales of accumulated production through trade practices actionable under U.S. law.

Wilson, John W. (March 11, 1985), "America's High-Tech Crisis", Business Week, pp. 56-67.

This is an overview of the reasons why the U.S. electronics industry has been overtaken by foreign competitors, especially by the Japanese who "have made no secret of their goal to dominate the world's computer and communications markets." Japan's capital investment costs are lower than the U.S.'s and automation is widespread in Japan's electronic industry. The author points out that the divestiture of AT&T and the deregulation of the telecommunications equipment business "provided foreign competitors with the biggest unilateral trade concession of the decade." One result was a 31 percent increase in imported communications gear in 1984.

Wolff, Alan W. et al. (1985), Government Procurement of Semiconductors--Economic and Environmental Issues Affecting a Major Strategic Resource, a Semiconductor Industry Association White Paper, San Jose, California.

This paper asserts that the U.S. Government procurement and specification system in current use for semiconductor procurement was designed for the production technology in use in the 1960s when Government purchases accounted for some 90 percent of the semiconductor market. This system makes it "virtually impossible" for manufacturers to achieve the production volume that would enable them to fully utilize modern methods of quality control or to minimize production costs. The result is higher per-unit cost for semiconductors whose quality is, at best, no higher than semiconductors produced commercially but not subject to Government specifications and testing. The paper recommends that the Government, U.S. semiconductor industry, and U.S. manufacturers of Government-use equipment employing semiconductors should form a board; this board would establish policies and objectives for improving the Government's system for procurement and specification of semiconductors, thereby allowing cost-effective volume production of semiconductors for Government use.

Wolff, Alan W. et al. (June 14, 1985), Japanese Market Barriers in Microelectronics: Memorandum in Support of a Petition Pursuant to Section 301 of the Trade Act of 1974 as Amended, San Jose, CA: Semiconductor Industry Association.

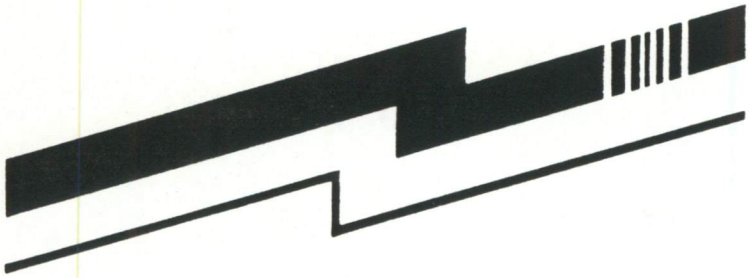
This study analyzes the origin and nature of Japanese market barriers in microelectronics and assesses their effect on the U.S. semiconductor industry. The results of the study are used to provide the legal basis for a petition to seek relief for the U.S. semiconductor industry under Section 301 of the Trade Act of 1974. The requested relief is stated in terms of recommended changes in U.S. policy objectives and recommended Presidential actions.

APPENDIX 6-B

FOREIGN SOURCES QUESTIONNAIRE

and

TRANSMITTAL LETTER



National Security
Telecommunications
Advisory Committee
NOV 14 1986

MEMORANDUM FOR THE INDUSTRY EXECUTIVE SUBCOMMITTEE

SUBJECT: Telecommunications Industry Dependence on Foreign Sources Survey

1. The Joint Industry-Government Telecommunications Industry Mobilization (TIM) Group is currently studying the telecommunications industry's dependence on foreign sources. The Group's objective is to assess the implications of any foreign dependencies for U.S. telecommunications industry mobilization capabilities. To provide a basis for this assessment, the Joint TIM Group is seeking National Security Telecommunications Advisory Committee (NSTAC) member responses to a Dependence on Foreign Sources Survey (enclosure 1).

2. The Survey consists of a small set of open-ended questions relating to four common types of equipment, excluding semiconductor components. The Group is seeking the personal involvement of Industry Executive Subcommittee (IES) members in overseeing the completion of the survey within their respective companies. However, it is anticipated that responses will be developed in consultation with company procurement experts and, if necessary, vendors and subcontractors.

3. It is recognized that company responses may contain "proprietary information." The Joint TIM Group staff is prepared to take all steps necessary to protect such information, including the execution of nondisclosure agreements where necessary. Responses containing proprietary information will NOT be made available outside the TIM Group staff absent execution of a nondisclosure agreement or consent of the company submitting the response. Survey data will be analyzed, aggregated, and summarized by the Joint TIM Group staff. Aggregated survey results will be reported to the TIM Group, IES, NSTAC, and the NCS Committee of Principals/Council of Representatives in a non-proprietary manner.

4. To permit the Joint TIM Group to make a preliminary report to the NSTAC in February 1987, completed survey responses should be returned by December 19, 1986 to the Joint TIM Group Chairman, CAPT Charles F. Noll, Assistant Manager, NCS Joint Secretariat, National Communications System, Washington, DC 20305-2010. A draft letter from IES companies to the Joint Secretariat is enclosed for your use (enclosure 2). If you desire to have Joint TIM Group staff members execute nondisclosure agreements with your company prior to being

provided access to any proprietary information contained in your response, please notify CAPT Noll as soon as possible. Questions regarding completion of the survey may also be addressed to CAPT Noll, (202) 692-9274 or to John S. Edwards, Northern Telecom, Inc., (703) 847-7480.

2 Enclosures a/s

B. E. MORRISS
Chairman, Industry Executive
Subcommittee

Distribution:
(See enclosed list)

DISTRIBUTION TO IES MEMBERSHIP

AT&T	Mr. Michael A. Brunner
BELLCORE	Mr. Marvin W. Konow
COMSAT	Mr. Gilbert D. Rye
CSC	Mr. Robert Steele
CONTEL	Mr. Larry E. Willner
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UTC	Mr. Frank McAbee
UTI	Mr. Thomas A. Norman
USTA	Mr. John N. Rose
WU	Mr. David E. Trexler

TELECOMMUNICATIONS INDUSTRY
DEPENDENCE ON FOREIGN SOURCES SURVEY
November 18, 1986

I. INTRODUCTION

The Joint Industry-Government Telecommunications Industry Mobilization (TIM) Group established by the National Security Telecommunications Advisory Committee (NSTAC) and the National Communications System (NCS) is studying the telecommunications industry's dependence on foreign sources. The Group's principal objective is to assess the implications of any foreign dependencies for U.S. telecommunications industry mobilization capabilities. To provide a basis for this assessment, the Joint TIM Group is seeking the views of the NSTAC member companies.

The survey consists of a small set of open-ended questions. They relate to the impact of any interruption or loss of foreign source availability on the production, operation, maintenance, or integration of equipment currently used in providing telecommunication services or equipment for lease or sale in the U.S. To provide a sharper focus for the survey, the industry members of the Joint TIM Group have identified four common types of equipment, excluding semiconductor components, for consideration:

- Digital Central Office Switching Equipment
- Fiber Optics Electronic Terminal Equipment (including repeaters)
- Telephone Sets
- Satellite Ground Stations (including uplinks, downlinks, TT&C, and antennas).

The industry members of the Joint TIM Group have concluded that foreign dependency in the semiconductor area is widely acknowledged and well-documented. Therefore, the Group is excluding semiconductors from this survey, seeking to identify any other items or components that might present foreign availability problems under mobilization conditions.

The Joint TIM Group is addressing mobilization issues only and not the trade and economic implications of foreign dependency. The information gathered by means of this survey will be used for mobilization assessment purposes only. More specifically, it will be used by the Joint Tim Group as a basis for:

- assessing the overall dependency of the U.S. telecommunications industry on foreign sources and potential impacts on mobilization capabilities
- identifying specific items or areas that should be studied in more detail
- formulating recommendations for any actions needed to enhance industry mobilization capabilities.

Enclosure 1

The data obtained from company responses to the survey will be collected, analyzed, aggregated, and summarized by the Joint TIM Group staff. It is recognized that company responses may contain "proprietary information." Completed responses from participating companies containing proprietary information will not be made available outside the staff without the express permission of those companies. The Joint TIM Group staff is prepared to take all steps necessary to protect such information, including the execution of nondisclosure agreements where necessary. A report on the survey results will be made available to the NSTAC.

II. DEFINITIONS

A. Mobilization

The Joint TIM Group has adopted the following definition of mobilization:

> The process of marshalling those telecommunications resources needed to make the transition from a normal state to a state of readiness for war or other national emergency.

The Group has further agreed that mobilization encompasses the transition period from peacetime/disaster/crisis through subsequent military actions external to the continental United States.

Under mobilization conditions, there might be an interruption or loss of foreign source availability as a result of crisis or external military action. This could, in turn, affect the telecommunications industry's capacity to sustain its production of telecommunications equipment and its ability to provide telecommunications services.

The following set of four mobilization time periods is being used by the Joint TIM Group:

(1) Pre-mobilization: Planning and Pre-positioning

(2) Short-Term: 0 to 90 days (Reallocation and reprioritization of existing capability and service)

(3) Mid-term: 90 to 180 days (Reallocation and reprioritization of products and services in in the pipeline)

(4) Long-term: over 180 days (Expand production of capacity and services.)

B. Foreign Sources

For the purposes of this survey, foreign sources are sources outside the United States and Canada*, whether U.S. or foreign owned. The Joint TIM Group recognizes that the origin of many common components may not be readily

*"Foreign sources" definition based on definition of "Industrial Base" (DoD Directive 4005.1, Enclosure 2, SUBJECT: Industrial Preparedness Program, November 26, 1985)

determined. For this reason, specific information on particular parts or components is not sought at this time. Rather, the Joint TIM Group is requesting your best judgment on the effect foreign source unavailability might have on your company's and the industry's ability to produce or obtain the equipments identified.

III. INSTRUCTIONS

The foreign dependence survey consists of five questions. Because of the open-ended nature of the questions, companies are free to provide the level of detail that they judge to be appropriate. Although members of the Industry Executive Subcommittee (IES) may personally oversee the completion of the survey within their respective companies, it is anticipated that responses will be developed in consultation with company procurement experts and, if necessary, with vendors and subcontractors. The Joint TIM Group would appreciate specific examples or definitive data whenever possible.

Please address the five questions in terms of the following types of equipment currently produced, operated, maintained, or integrated by your company:

- Digital Central Office Switching Equipment
- Fiber Optics Electronic Terminal Equipment (including repeaters)
- Telephone Sets
- Satellite Ground Stations (including uplinks, downlinks, TT&C, and antennas).

The Joint TIM Group is seeking general information regarding the impact of foreign source unavailability on existing capabilities and services over the time periods defined in Section II. The Joint TIM Group is not expecting information regarding companies' abilities to surge to a specific level of production (e.g., double or quadruple existing capacity).

Please provide specific examples and/or quantitative data if available. If your company does not produce, operate, maintain, or integrate one or more of the four types of equipment, you should simply skip discussion of that equipment in Question 1.

Completed survey responses should be returned by December 19, 1986 with the attached form (page 5). Any information which your company believes to be proprietary should be identified/marked with one of the following, or a similar notice:

- MCI Proprietary
- AT&T Proprietary
- Notice: Not for use or disclosure outside C&P Telephone except under written agreement

IV. QUESTIONS

1. What, if any, particular items, materials, or components (excluding semiconductors) associated with the four types of equipment identified in Section III warrant detailed study by the Joint TIM Group from a foreign dependency/mobilization perspective?

2. In your estimation, how would the unavailability of foreign sourced materials and components (excluding semiconductors) affect your company's ability to continue to produce, operate, maintain, or integrate the four types of equipment identified in Section III? In addition, please specifically identify, if possible, those companies which would constitute primary alternative domestic sources.

3. In your estimation, how would the unavailability of foreign sourced materials and components (excluding semiconductors) for these types of equipment constrain or impair the telecommunications industry's ability to mobilize and/or sustain a long term (beyond six months) mobilization effort?

4. What steps might industry and/or the Federal government take to mitigate, reduce, or eliminate any adverse effects of foreign dependencies on the telecommunications industry's ability to mobilize effectively and to sustain a long term mobilization effort?

5. Other comments or suggestions (e.g., What other important aspects or dimensions of the dependence on foreign sources issue should be addressed by the Joint TIM Group? Are there other types of equipment that should be studied? Are there identifiable trends toward greater or lesser reliance on foreign sources?)

DRAFT

CAPT CHARLES F. NOLL, USN
Assistant Manager, NCS Joint Secretariat
National Communications System
Washington, D.C. 20305-2010

Dear Captain Noll:

Enclosed is (name of company) response to the Joint TIM Group Telecommunications Industry Dependence on Foreign Sources Survey.

You (have/do not have) our permission to circulate or disclose our completed survey response to anyone outside the Joint TIM Group staff. (Name of company) proprietary information has been provided and so marked as specified in the instructions. We (do/do not) desire to have all individuals execute nondisclosure agreements prior to being provided access to such proprietary information. For further information, please contact (names and phone numbers) .

(signature of IES member)

Enclosure 2

APPENDIX 6-C

SUMMARY OF SURVEY RESPONSES

04/24/87

SUMMARY OF RESPONSES TO SURVEY QUESTION #1

ITEMS NEEDING FURTHER STUDY

Adhesives

Ceramics

Ceramics Reasonators

Epoxies

Ferrite Cores for Transformers and Inductors

Fiber Optic Connectors (between the Terminal and the Fiber Cable)

Fiber Optic Terminals

Frequency Converters Associated with Low Noise Amplifiers

Hybrid Circuits Used in Fiber Optic Transmission Equipment

Klystrons

Low-Noise Amplifiers

Photodefinable Polymers

Plastic Sealed Relays

Quartz Tubes for Lightwaves

SAW (Surface Acoustic Wave) Filters

Silicones

Solder Paste

Spare Parts for Foreign-Made Assembly Equipment for Printed Circuit Boards

Specific-Channel Set-Top Receivers

Telephone Sets (including Special Sets Designed for Use with Foreign-Made Switches

Traveling Wave Tubes

SUMMARY OF RESPONSES TO SURVEY QUESTION #2

IMPACT OF CUT-OFF ON COMPANY OPERATIONS?

o SERVICE PROVIDERS

No Response (1)

Little or No Effect

- Operations normal up to 180 days, but dependent on U.S. and Canadian sources for replacement parts and new equipment.
- No serious effects on central office switching equipment.
- Very little impact overall; main impact on cost and schedule.

Some Effect

- Difficulty in incorporating/integrating domestic fiber optic terminal equipment with existing fiber optic systems. Would probably buy new domestic systems.
- Beyond a year, low noise converters and set-top receivers might become a problem.
- Cut-off of foreign-sourced telephone sets would probably not significantly affect operations; cost of sets would be affected.
- Beyond 180 days, normal operations dependent on availability of new equipment, especially transmission equipment.

Significant Effect

- Serious impacts on telephone sets; alternative domestic plans could be reactivated.
- As stocks of equipment, components, and supplies are depleted, ability of company to restore, operate, and maintain services would be dramatically impacted in the absence of mobilization contingency plans.
- Continued maintenance and expansion of fiber optic transmission systems would be severely impacted, due to compatibility problems between foreign and domestic terminals and repeaters.

SUMMARY OF RESPONSES TO SURVEY QUESTION #2 (Concluded)

o MANUFACTURERS

No Impacts Identified (1)

Little or No Effect

- No impact on equipment needed to build, operate, and maintain satellite ground stations. Domestic sources adequate.

- No deleterious effect for equipment categories specified.

Some Effect (0)

Significant Effect

- Unavailability of foreign-made materials/components identified in Question #1 would significantly impair firm's ability to manufacture two or possibly three of the survey equipment categories. Some substitution is possible in the mid-term, but the combined capacity of alternate sources may not be adequate.

o INTEGRATORS

No Impacts Identified (1)

Little or No Effect (0)

Some Effect (0)

Significant Effect

- Offshore procurement escalating to a serious problem of national concern.

SUMMARY OF RESPONSES TO SURVEY QUESTION #3

IMPACT ON THE INDUSTRY?

- Telecommunications services

  -- No impact on satellite service

  -- Shortages in all four equipment categories in the short term. Government and industry priorities would be needed.

  -- In long term, effects would be chiefly economic. Higher costs and lower rate of deployment due to financial constraints.

  -- No impact on international service carriers since they are usually equipped to operate over long periods of time without replacement of operating equipment.

  -- No significant impairment except possibly in fiber optic systems.

  -- Little or no disruption in peacetime or pre-hostility mobilization following hostilities. Essential services could probably be maintained by cannibilization until manufacturing surge capability is brought on-line.

  -- The industry is now in a position to sustain a 3-6 month mobilization. That period will be significantly reduced over the next few years. The pipeline "float" provides less and less of a strategic reserve because of economic factors.

- Telecommunications manufacturing

  -- Unavailability of foreign items would impair industry's ability to mobilize.

  -- In short- or mid-term, industry's ability to manufacture central office, PBX, and possibly other equipment could be adversely affected by unavailability of foreign-made items.

  -- No impact on ability to provide/maintain satellite ground stations (if semiconductors are not considered).

- Telecommunications Integration

  -- Offshore procurement escalating to a serious problem of national concern.

  -- North American industries could obtain all but most exotic raw material and manufacture most components. Products with long lead times could create severe obstacles.

SUMMARY OF RESPONSES TO SURVEY QUESTION #4

MITIGATION STEPS BY GOVERNMENT OR INDUSTRY?

- Maintain list/database of key equipment, materials, and components, showing manufacturers and alternate sources.

- Promote foreign-owned plants in U.S. Encourage North American investment in manufacture of critical items, possibly as joint ventures.

- Gather more data/monitor trends.

- Encourage domestic manufacturing/research and development.

  -- Remove manufacturing restrictions on certain U.S. companies.

  -- Promote competition.

  -- Develop non-foreign sources.

  -- Create Department of Science and Technology to formulate national policy.

  -- Enhance incentives for private sector R&D, e.g., tax credits.

  -- Support basic research and training for scientists/engineers.

  -- Increase support for university and joint private sector manufacturing technology research efforts.

  -- Strengthen protection of intellectual property rights/confidentiality of scientific information.

  -- Balance the legitimate goals of regulation with the need to bring the results of innovation to the marketplace.

  -- Pursue stable monetary policy and let free market determine where capital will flow.

  -- Change U.S. antitrust law to reflect new global markets.

  -- Balance the need for competitiveness in world markets with national security and foreign policy considerations when controlling U.S. exports.

- Use non foreign-source dependent facilities for NSEP services. Incorporate Buy American clauses in industry/Government contracts.

- Develop and maintain mobilization contingency plans.

- Stockpile critical items not obtainable from U.S. or Canadian sources.

SUMMARY OF RESPONSES TO SURVEY QUESTION #4 (concluded)

- Develop multiple sourcing agreements.
- Prohibit or control dumping of critical telecommunications components.
- Increase dialogue among Government, industry, labor, academia, and other interested parties.
- Improve national ability to redeploy labor affected by changing markets and technologies.
- Make trade a national priority and give greater emphasis to trade policy and policy-making. Create a Department of Trade.

SUMMARY OF RESPONSES TO SURVEY QUESTION #5

COMMENTS/SUGGESTIONS?

- Expand the survey to include the following items (List is derived from five survey responses.)

  -- Analog switching and carrier systems

  -- High speed modems

  -- Terrestrial microwave equipment

  -- HF radio equipment

  -- Microwave radio

  -- Cellular radio/telephone

  -- Computers and peripherals

  -- Test equipment

  -- Private radio/carrier systems (such as used by pipelines and power companies)

  -- Non-electronic equipment needed to support telecommunications equipment, such as power generators and switch gear; steel towers; heating, ventilating, and air conditioning equipment; and fire suppression systems.

  -- Matrix switching equipment

  -- Multiplexing equipment

  -- Large satellite communications antennas

- Trends toward greater reliance on foreign sources need not portend severe problems if critical areas are recognized and addressed.

  -- Note: Respondent does not indicate how these problems should be approached.

- Consider the creation of hardware stockpiles in strategic locations.

SUMMARY OF RESPONSES TO SURVEY QUESTION #5 (concluded)

- Identify equipment available from DOD and other Government sources (as indicated in contingency plans) with distribution/allocation to be managed by the NTMS and NCC.

- Query all manufacturers of NSEP-related digital central office switching equipment to complete the identification of foreign-sourced critical items.

- Examine U.S. trade and export policies (including national security controls) and licensing procedures, with a view to improving our competitive position and strengthening national security.

NCS 1064/2

8.0 MAINTENANCE OF STOCKPILES AND INVENTORIES (FINAL REPORT)

June 1988

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

The stockpiling of certain critical items has been proposed as one solution to supply problems that might arise during mobilization, e.g., as a result of a cutoff of foreign supplies of telecommunications equipment, materials, or components. Maintenance of Stockpiles and Inventories is thus one of seven subjects to be addressed by the Joint Industry-Government Telecommunications Industry Mobilization (TIM) Group, which is charged to (1) identify possible impediments to effective Telecommunications Industry mobilization and mobilization planning, and (2) assist in the development of corrective actions to overcome any identified impediments.

The Group received information briefings on stockpile and inventory policies and practices from representatives of both the Government and the Telecommunications Industry and obtained additional information from Government documents and other sources. The Group found that large inventories of materials, equipment, and supplies are maintained by certain organizations within the Federal Government. For example, the National Defense Stockpile includes 62 types of materials (primarily metals and minerals) valued at about $9 billion, which are reserved for use in defined contingencies. In addition, the Department of Defense maintains an inventory of "secondary items" (replacement parts, spares, clothing, medicine, and other supplies -- not major weapons systems or vehicles) that contains 4.7 million line items valued at over $90 billion. In both of these cases, the time required to add new items to the inventories, while varying considerably by circumstance, is typically several months to more than a year.

In the Telecommunications Industry, there is a conscious effort to minimize inventories. The general trend is to keep on hand only the minimum quantities needed to meet existing or near-future demands. Rapid acquisition of supplies with delivery on a just-in-time basis has become a standard operating procedure, largely to reduce costs and to avoid the accumulation of obsolescent materials.

Modern telecommunications manufacturing systems that employ inventory minimization techniques have greatly increased the efficiency and maximum output capacity of domestic manufacturers. Thus, on balance, these approaches have increased the ability to meet surge requirements during mobilization and are essential to maintaining the competitiveness of the Nation's industrial base. However, such fine-tuned production systems may be more vulnerable to disruptions in the supply of components than would have been the case in previous national emergencies. In view of the findings in the Group's earlier report on Dependence on Foreign Sources, this situation causes concern.

The Group also found that existing contract mechanisms can be used, by both Government and Industry, to require telecommunications service and equipment vendors and component suppliers to maintain inventories of specified items that might be needed to support the provisioning of service or production of equipment. These findings have led the Group to observe that its concern about supply vulnerabilities can perhaps best be addressed through contractual mechanisms that ensure the availability of critical components and spare parts, rather than through the imposition by Government of uneconomic inventory requirements on telecommunications manufacturers.

Conclusions

On the basis of information received in briefings, its review of reports and other published documents, and discussions with representatives of Government and Industry, the Group reached the following conclusions regarding the maintenance of stockpiles and inventories for purposes of national security emergency preparedness (NSEP):

- No dedicated NSEP stockpiles of telecommunications materials, components, or equipment available to Industry currently exist within either Government or Industry.

- Rapid advances in technology result in rapid obsolescence of end items. The task of minimizing obsolescence in NSEP stockpiles of telecommunications components and equipment would be formidable.

- The specification and maintenance of such stockpiles, whether by Government or Industry, would be costly and complex.

- To the extent that minimum-inventory techniques represent Industry practice, severe dislocations in supply channels during mobilization could adversely impact the ability of Telecommunications Industry manufacturers to deliver goods and products.

- The imposition of requirements on Industry to maintain stockpiles or surplus inventories for NSEP purposes could adversely affect U.S. Industry's competitive position in the world market for telecommunications equipment or services.

- o No mechanism is currently available whereby the Government could compensate Industry as a whole for the costs (including penalties to competitive position) of meeting a Government-imposed general requirement to maintain special-purpose stockpiles or surplus inventories.

- o Contracting mechanisms are currently available and in use whereby telecommunications service providers or equipment suppliers are required to maintain (during defined contract periods) specified inventory levels of certain components, materials, equipment items, spare parts, backup systems, etc., for use in peacetime emergencies and other stress conditions.

- o No compelling need for NSEP stockpiles of surplus inventories to serve the Telecommunications Industry as a whole has been found during this study.

- o No further action or study of this subject by this Group is needed at this time.

Recommendation

Although no compelling need for NSEP stockpiles has been found in this study, the contracting mechanisms that are currently available and in use for requiring specified inventory levels of certain critical items should be considered in telecommunications mobilization policy and planning.

8.1 Introduction

The Joint Industry-Government Telecommunications Industry Mobilization (TIM) Group was established by the President's National Security Telecommunications Advisory Committee (NSTAC) and the National Communications System (NCS) Committee of Principals (COP) to:

(1) Identify possible impediments to effective telecommunications industry mobilization and mobilization planning, and

(2) Assist in the development of corrective actions to overcome any identified impediments.

The subject of Maintenance of Stockpiles and Inventories was identified by the NSTAC as one of seven mobilization subjects to be addressed by the Joint TIM Group. This subject is also related to other subjects addressed by the Group: Dependence on Foreign Sources, Telecommunications Service Surge Requirements, and Government and Industry Mobilization Management Structure. Special purpose stockpiles or greater-than-normal inventories of certain materials, components or equipment were suggested as possible solutions to problems that could arise during mobilization, especially if foreign sources of supply were cut off. A surge in service requirements during mobilization may engender a surge in the production of equipment or the provisioning of services, either of which will depend on materials, components, or equipment in inventory or available for rapid procurement. Finally, the availability of materials, components, and equipment during periods of mobilization or other national emergency may be subject to management (i.e., acquisition and allocation) controls imposed by Government.

This report outlines the Joint TIM Group's approach to the study of Stockpiles and Inventories, and presents its findings and conclusions.

8.2 Background/Approach

In December 1984, the NCS asked the NSTAC to assist the Government in assessing Telecommunications Industry mobilization and mobilization planning capabilities. In response to the Government's request, the NSTAC charged its Industry Executive Subcommittee (IES) to assist the Government in bringing the issue into sharper focus and to develop recommendations regarding a future role for NSTAC in the area of Telecommunications Industry mobilization. The IES, in turn, established a Telecommunications Industry Mobilization (TIM) Task Force and instructed it to develop a TIM issue statement.

The TIM Task Force defined and clarified the Telecommunications Industry mobilization issue, identifying seven areas for further study by Industry and Government, including Maintenance of Stockpiles and Inventories. The findings of the TIM Task Force in the area of Stockpiles and Inventories were included in a two-volume report and presented for review and approval at the October 9, 1985, meeting of the NSTAC[1]. The NSTAC subsequently charged its IES to assist the NCS in addressing the seven mobilization subjects identified.

For study purposes, the Joint TIM Group uses the definition of mobilization developed by the original NSTAC TIM Task Force:

> The process of marshalling those telecommunications resources needed to make the transition from a normal state to a state of readiness for war or other national emergency.[2]

Mobilization is considered by the Joint TIM Group to encompass peacetime/disaster/crisis through subsequent conventional military actions external to the continental United States, as illustrated in Figure 8-1. The impact of a nuclear attack on the United States has been judged by the Joint Group to be outside the scope of its study. In addition, the following mobilization time periods are being used by the Group:

(1) Pre-mobilization: Planning and Pre-Positioning

(2) Short-Term: 0 to 90 Days (Reallocation and Reprioritization of Existing Capability and Service)

(3) Mid-Term: 90 to 180 Days (Reallocation and Reprioritization of Products and Services in the Pipeline)

(4) Long-Term: Over 180 Days (Expanded Production of Capacity and Services).

The Group's overall objectives concerning stockpiles and inventories reflect the provisions of the TIM Implementation Measure in the NCS NSEP Telecommunications Plan of Action (NTPA), calling for:

- The identification of possible impediments to effective telecommunications industry mobilization and mobilization planning and the recommendation of corrective actions and

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[1] Final Report of the Telecommunication Industry Mobilization (TIM) Task Force, Volume 1, "TIM Issue Statement," and Volume 2, "Background and Supporting Materials," September 5, 1985.

[2] Final Report of TIM Task Force, Volume I, p.5

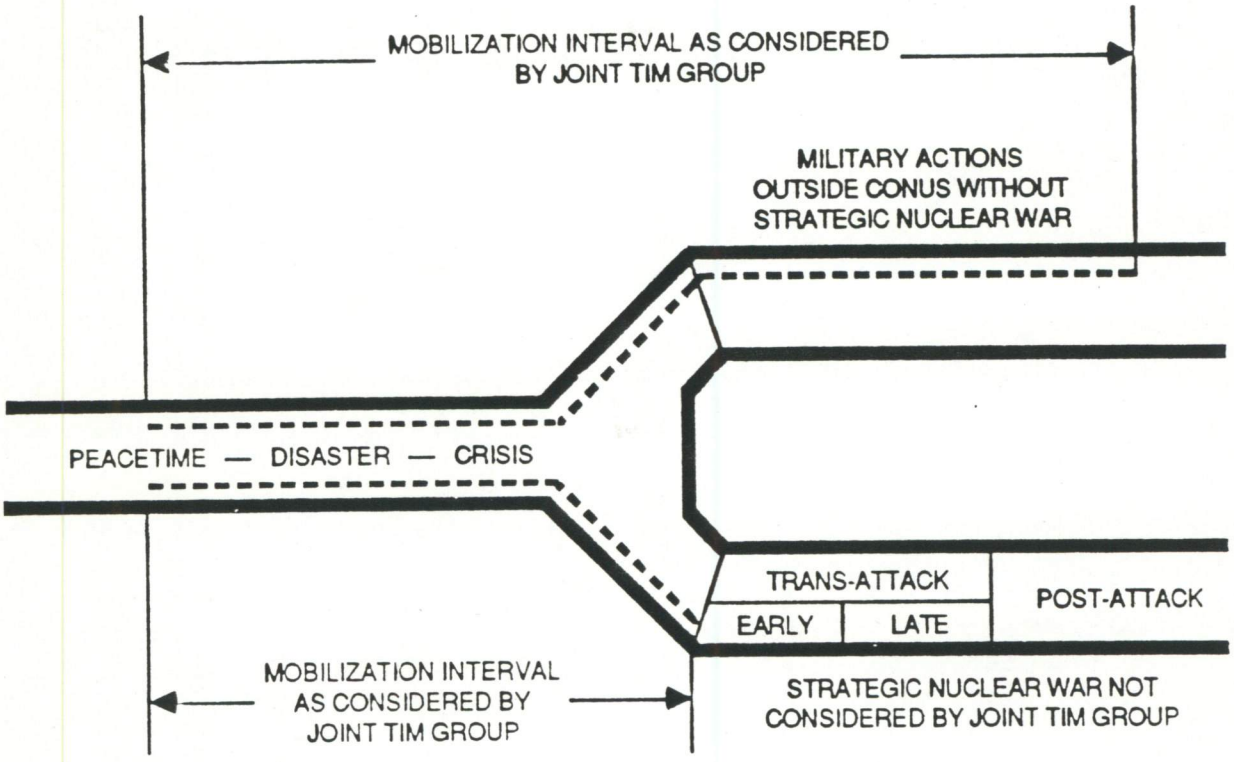

FIGURE 8-1

MOBILIZATION INTERVAL

The identification and recommendation of any Federal Government actions needed to support telecommunications industry mobilization planning activities.[3]

The Joint TIM Group is using the work of the original NSTAC TIM Task Force as the starting point for more detailed analysis. In its final report to the NSTAC, the original TIM Task Force summarized its concerns in the Maintenance of Stockpiles and Inventories area as follows:

> As a standard business practice, industry does not maintain large stockpiles of critical raw materials for use in the event of mobilization. Any such stockpiling of materials for mobilization use would therefore typically be undertaken only at the specific request of the Government and would require Government funding. Further investigation is required to assess various incentives that might be used to encourage industry to stockpile materials for Government use in a mobilization effort (e.g., the elimination or alleviation of relevant taxes).
>
> The maintenance of large inventories of equipment (e.g., switching equipment), finished goods, subassemblies, critical single source scarce circuits, spare parts (e.g., integrated circuit chips), and facilities has associated with it many of the same problems as stockpiling, including the obsolescence of items stored for a long period. It is an uneconomic business practice to maintain large inventories of items in a dynamic technological environment. On the other hand, there might be certain types of facilities, such as undersea cables or manufacturing facilities, that would be critical to a mobilization effort, impossible to replace quickly, and irretrievably lost, if not mothballed when taken out of service. Further study is required so that Government can advise industry of the items that should be stockpiled or kept in inventory despite technological advances. The question of who will pay for the maintenance of such inventories must also be addressed.[4]

The Group's approach to the subject of Stockpiles and Inventories involved the following steps:

- Definition of the terms "stockpiles" and "inventories" for study purposes;

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[3]Implementation Measure 9, "Telecommunications Industry Mobilization," National Security Energy Preparedness (NSEP) Telecommunications Plan of Action, NCS Document No. 208/5, June 27, 1985.

[4]Final Report of the TIM Task Force, Volume I p.9.

- o Establishment of an information base by
  - Obtaining Industry briefings on current Telecommunications Industry stockpiling and inventory policies and practices;
  - Obtaining Government briefings on the telecommunications-related components of Government stockpiles and inventories, including those overseen by DOD and FEMA;
  - Reviewing the relevant technical literature;
  - Utilizing the available information on (1) foreign-sourced materials, equipment and components, and (2) equipment needed to meet surge demands (developed in the Group's study of related subjects), and augmenting this information base as necessary;
- o Identification of specific issues to be studied;
- o Analysis of the available information in light of the issues identified;
- o Development of conclusions and recommendations.

8.2.1 Definitions

The following definitions were adopted for purposes of this study.

Inventory: The stock of supplies, raw materials, work in process, and finished goods or merchandise held by a private-sector or Government entity at any point in time, exclusive of fixed assets.

Stockpile: That part of an inventory, in excess of quantities normally needed for production of goods or provision of services, which is held in reserve for use under special circumstances or in defined contingencies.

8.2.2 Sources of Information

The Joint TIM Group obtained information relative to stockpiles and inventories through three principal avenues: briefings presented by representatives of Government or Industry organizations concerned with this subject, a survey of published documents and articles, and the expertise of individual Group members.

The organizations that presented briefings are identified, together with the subjects of the briefings, in Table 8-1. The results of the literature survey formed the basis for presentations to the Group and the bibliography presented in Appendix 8-A. Discussions of Government contracting mechanisms and Industry inventory practices by Group members served as the basis for significant findings in these two areas.

TABLE 8-1
MAINTENANCE OF STOCKPILES AND INVENTORIES
BRIEFINGS AND INTERVIEWS

BRIEFINGS

Title/Subject	Presented By
National Defense Stockpile	Richard E. Corder Industry Specialist Federal Emergency Management Agency (FEMA)
National Defense Stockpile	Robert O'Brien Director of Stockpile Operations General Services Administration (GSA)
DOD Supply System Inventories	James H. Reay Director, Supply Management Policy Office of the Secretary of Defense (OSD)
Mobilization for Growth	William M. Boyst, Jr. (III) Director, Materials Management Northern Telecom, Inc Research Triangle Park, N.C.

INTERVIEWS

Person/Subject	Affiliation
Dick Helmer (concerning DOD Inventories)	Deputy Associate Director National Security and International Affairs Division General Accounting Office (GAO)
Uldis Adamsons (concerning National Defense Stockpile)	Group Director National Security and International Affairs Division General Accounting Office (GAO)

8.2.3 Issues

As its study of Stockpiles and Inventories progressed, the Joint TIM Group identified specific issues that need to be addressed from the perspective of national security emergency preparedness (NSEP) telecommunications. These issues, listed below, provided one basis for analyzing the information acquired. They have also proved useful in the formulation of the Group's conclusions.

- Are the inventories (and, in some cases, stockpiles) that are normally maintained by telecommunications carriers and manufacturers adequate for mobilization conditions (especially if foreign supplies are cut off)?

- If normal stockpiles and inventory levels are not adequate for mobilization, should they be augmented for purposes of national security or for other use during mobilization?

- If above-normal stockpiles/inventories are needed,

  - Who should maintain them?

  - Who decides what items they should contain, and in what quantities?

  - Who should bear the cost?

- In view of rapidly changing telecommunications technologies, obsolescence is a continuing concern. If stockpiles and inventories beyond those normally maintained by Industry are needed, what measures or procedures are needed to minimize obsolescence and ensure that stocked items will meet current needs?

- How do the stockpiles and inventories being considered by the Joint TIM Group relate to the National Defense Stockpile and to specialized inventories of components and equipment maintained by the Department of Defense (and other Federal organizations)?

- The TIM Dependence on Foreign Sources study identifies items that may be candidates for stockpiles or expanded inventories. Should the Group recommend Government or Industry criteria for such items?

8.3 Findings

The Group found that certain of the major stockpiles and inventories maintained by Government organizations serve purposes that are basically different from those of their Industry counterparts, and are managed under a very different philosophy. Certain relevant policies and practices in these two arenas are outlined below.

8.3.1 Inventory Policies and Practices in Government

Many of the Government departments and agencies that are members of the National Communications System have substantial telecommunications assets, and some maintain inventories of repair parts, spares, and maintenance equipment. Most of these inventories are designed to support specific Government telecommunications, and cannot be expected to serve as a source of supply to the Telecommunications Industry during national emergencies. One major Government inventory, the National Defense Stockpile, (NDS) is intended to supply certain industrial and essential civilian needs during emergencies. The Joint TIM Group investigated whether the NDS could supply certain Telecommunications Industry needs that could not be otherwise met during times of mobilization. The Group also investigated the feasibility of drawing from another major Government inventory, the Department of Defense inventory of secondary items, under mobilization conditions.

8.3.1.1 Authorities and Responsibilities. The Federal Government's authorities and responsibilities in this area are derived primarily from the Defense Production Act of 1950, as amended,[5] and the Strategic and Critical Materials Stockpiling Act, as amended[6]. Executive Order 10489, as amended, and Executive Order 12155 further delegate the functions contained in these two statutes. The Defense Production Act authorizes the Government to use its priorities and allocation system to acquire materials for stockpiling; provides for the expansion of industrial capacity and the use of financial incentives to achieve such expansion; and authorizes the establishment of voluntary agreements between companies for mobilization purposes. Executive Order 10489 delegates the responsibility for administering these provisions to the Federal Emergency Management Agency (FEMA), the Department of Commerce (DOC), and the General Services Administration (GSA).

The Strategic and Critical Materials Stockpiling Act requires the President to identify raw material needs and take steps to ensure their availability in the National Defense Stockpile for national security purposes. These materials are those that (a) would be needed to supply the military, industrial, and essential civilian needs of the United States during a national emergency and (b) are not found or produced in the United States in sufficient quantities to meet such needs. Executive Order 12155 dated September 10, 1979, delegates responsibility for administering the provisions of the Act to FEMA, GSA, and the Department of Interior (DOI). On February 25, 1988, the management functions of FEMA and GSA were transferred to the Department of Defense by Executive Order 12626.

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[5] 64 Stat. 798; 50 U.S.C. App. 2061 et seq.

[6] Public Law 96-41; 50 U.S.C. 98 et seq.

8.3.1.2 National Defense Stockpile (NDS)[7] This stockpile contains "strategic and critical materials" that meet the two criteria given in the preceding paragraph. In the context of the NDS, materials are defined to include raw materials, articles, commodities, products, supplies, components, technical information, and processes.

The content of the NDS is reported in terms of 62 line items (materials or groups of materials). These are listed in Table 8-2. Most are raw or semiprocessed materials, primarily metals and other non-energy minerals. The national petroleum reserve is not part of this stockpile. The NDS also contains a few organic materials such as rubber, morphine, quinine, but few (if any) communications-related materials, components, or equipment.

The current value of the stockpile is about $9 billion. This is just over half of the stockpile level calculated to be sufficient to meet military, industrial, and essential civilian needs during a 3-year conventional global military conflict (as mandated by Congress in 1979).

The content of the stockpile is reviewed annually and may be adjusted, both in terms of the selection and quantities of materials, to match current needs. Surplus materials can, with Congressional approval, be sold, and deficits can be acquired as funds permit. The vast quantities of materials in this stockpile are stored at various locations around the country, in facilities that range from open mounds of ore or metal exposed to the weather, to protectively-packaged containers stored in environmentally controlled enclosures.

At present, some 22 new items are being considered for addition to the stockpile. These are listed in Table 8-3. Some of these, such as gallium, large-diameter float-zone silicon, and certain compound materials, are for semiconductor devices. The assessment process for selecting new materials and implementing their addition is quite slow in relation to the rapid rate of change in semiconductor and integrated-circuit technology.

8.3.1.3 Department of Defense Supply System. DOD's inventory of secondary items (such as replacement parts, spares, clothing, medicine, and other supplies, not major weapons systems or vehicles) contains 4.7 million line items and is valued at over $90 billion. About $5 billion is in electrical and electronic supplies.

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[7] The following discussion of the National Defense Stockpile is based on information obtained before the transfer of management from FEMA and GSA to DOD had been fully implemented, and therefore reflects management policies and practices prior to the transfer.

TABLE 8-2
LIST OF NATIONAL DEFENSE STOCKPILE MATERIALS (AS OF MARCH 31, 1987)

1. Aluminum Metal Group	23. Graphite, Natural, other than Ceylon and Malagasy	44. Quinidine
2. Aluminum Oxide, Abrasive Grain Group	24. Iodine	45. Quinine
3. Antimony	25. Jewel Bearings	46. Ricinoleic/Sebacic Acid Products
4. Asbestos, Amosite	26. Lead	47. Rubber
5. Asbestos, Chrysotile	27. Manganese, Battery Grade Group	48. Rutile
6. Bauxite, Refractory	28. Manganese, Chemical and Metallurgical Group	49. Sapphire and Ruby
7. Beryllium Metal Group	29. Mercury	50. Silicon Carbide, Crude
8. Bismuth	30. Mica, Muscovite Block, Stained and Better	51. Silver, Fine
9. Cadmium	31. Mica, Muscovite Film, 1st and 2nd Qualities	52. Talc, Steatite Block and Lump
10. Chromium, Chemical and Metallurigcal Group	32. Mica, Muscovite Splittings	53. Tantalum Group
11. Chromite, Refractory Grade Ore	33. Mica, Phlogopite Block	54. Thorium Nitrate
12. Cobalt	34. Mica, Phlogopite Splittings	55. Tin
13. Columbium Group	35. Molybdenum Group	56. Titanium Sponge
14. Copper	36. Morphine Sulphate and Related Analgesics	57. Tungsten Group
15. Cordage Fibers, Abaca	37. Natural Insulation Fibers	58. Vanadium Group
16. Cordage Fibers, Sisal	38. Nickel	59. Vegetable Tannin Extract, Chestnut
17. Diamond, Industrial Group	39. Platinum Group Metals, Iridium	60. Vegetable Tannin Extract, Quebracho
18. Fluorspar, Acid Grade	40. Platinum Group Metals, Palladium	61. Vegetable Tannin Extract, Wattle
19. Fluorspar, Metallurgical Grade	41. Platinum Group Metals, Platinum	62. Zinc
20. Germanium	42. Pyrethrum	
21. Graphite, Natural, Ceylon Amorphous Lump	43. Quartz Crystals	
22. Graphite, Natrual, Malagasy Crystalline		

Source: ***Stockpile Report to the Congress, October 1986 - March 1987***
Federal Emergency Management Agency, FEMA 36, August 1987

TABLE 8-3
CANDIDATE NEW ITEMS FOR NATIONAL DEFENSE STOCKPILE

DOD HIGH TECH STRATEGIC & CRITICAL MATERIALS

A. MATERIALS

1. Indium
2. Bismuth
3. Gallium
4. Mercury
5. Rare Earth Metals
6. Selenium
7. Tellurium
8. Beryllium
9. Continuous & Discontinuous Metal-Matrix Composites (MMC)
10. Platinum Group Metals
11. High Purity Chromium
12. Scandium
13. Hafnium
14. Zirconium
15. High Purity Manganese
16. Rhodium
17. Ruthenium
18. Osmium
19. Rhenium
20. Cesium
21. Yttrium
22. Strontium

B. MATERIALS PROCESSES & MATERIALS CATEGORIES

1. Carbon & Ceramic Fibers
2. Compound Semiconductor Materials
3. Large Diameter, Float Zone Silicon Material
4. Advanced Structural (high temperature) Ceramics
5. Piezoelectric and other Transducer/Sensor Devices
6. Semiconductor Injection Lasers
7. Diamond Films for both Structural Purposes (wear, erosion) and Electronic Applications
8. High Critical Temperature Superconductors based on Ceramic Compositions
9. Large Diameter, Microelectronic Circuit Quality Czochralski Silicon Wafers
10. Magnetic and Optical Recording Media

Source: List Provided by FEMA Industry Specialist, January 15, 1988

While DOD's principal concern is with military hardware and supplies for deploying and sustaining its forces, it is also concerned with the broader aspects of supply, such as the availability of strategic materials and the adequacy of the industrial base to sustain deployed forces.

DOD's determination of needs is based on existing demands augmented by additional equipment and supplies required for projected wartime scenarios. To meet these needs, DOD normally maintains minimal inventories consistent with published Tables of Organizations and Equipment for specific units of the services. In many field units, inventory levels are normally intended to satisfy short-term initial replacement requirements while depots and other tiers in the supply system provide supplies for longer periods.

There are exceptions to the generality of minimum inventories within the DOD supply system. One arises as a consequence of the life-of-type acquisition concept, in which enough spares and parts for certain systems are purchased to support a particular equipment item or system throughout its projected lifetime. While this approach can lead to large inventories, it is a preferable alternative to the risk of a parts shortage at a time of urgent need. Another exception is the case of certain complex, high-risk systems such as defense communications satellites, where two entire systems may be kept in inventory against the possibility of an unsuccessful launch and to cover a projected 30-year need (assuming a 10-year life for each satellite).

To meet its current and projected needs for secondary items, DOD currently purchases this class of supplies (exclusive of major weapons systems and platforms) at a rate of about $40 billion per year. The length of time to acquire an item through normal procurement procedures is often a year or longer.

DOD is currently attempting to strengthen and tighten its supply system to make it more efficient, economical, and responsive to the needs of its users. Toward these goals, it is investigating and, where feasible, will attempt to implement certain of the acquisition and inventory practices currently being successfully employed in Industry.

With respect to possibility of matches between DOD inventory items and the Telecommunications Industry's needs during mobilization, a senior DOD supply official expressed the opinion that some potential opportunity exists, and expressed willingness to cooperate in exploring the matter in greater depth. He caution that supplies classified as War Reserve Stocks could not be used to support Industry needs.

8.3.2 Inventory Practices in Industry

From the beginning of its study of stockpiles and inventories, the Joint TIM Group recognized that the concept of special-purpose stockpiles or excess inventories runs counter to the widespread Industry practice of

minimizing inventories to reduce costs. The prevalence of this practice, and the degree to which it is carried, was underscored in briefings by Industry specialists.

Before its briefings by Industry, the Group had considered that Industry, in general, maintains minimum inventories consistent with demand for products or services. Under the minimum-inventory assumption, actual inventory level would be based on such factors as:

- Actual and projected demand levels and schedules
- Cost of:
  - -- Inventoried items
  - -- Money (i.e., interest)
  - -- Storage
- Anticipated change in availability and/costs ofinventoried items
- Taxes on inventory

Within the minimum-inventory philosophy, there is variation in approach from one company to another. The Group learned that at least one major manufacturing facility had achieved significant reductions in inventory by applying two basic concepts. One is the elimination of any step in the overall production process (including materials management) that does not contribute to the value of the product to the consumer. The other is the concept of Just-in-Time (JIT) availability of materials, components, subassemblies, and finished products. By implementing these concepts across the entire production process, the facility has significantly reduced its inventories.

Some companies maintain reserve equipment and supplies for use in emergencies. These reserves could, of course, be used in event of national security emergencies, but usually they are drawn upon to maintain service or to meet production commitments during less extreme emergency situations such as severe storms, major equipment failures, or transportation disruptions. The types and quantities of items held in company stockpiles or surplus inventories are generally based on business considerations, not national security.

8.3.3 Inventories Resulting from Contracts or Special Procurements

Certain types of procurement mechanisms have the effect of creating stockpiles or expanded inventories to support the items procured under a specific contract.

One is the life-of-type purchase (or buy-out), in which the purchaser, upon notification that certain spare parts or other support items for a previously purchased system (or other item) will no longer be

manufactured, purchases a sufficient quantity of such support items to support the basic item throughout its expected service lifetime. Another is the system support buy-out, in which a lifetime supply of support items is purchased for reasons not necessarily related to discontinuation of production. Both of these types of procurement reflect an attempt to insure that spare parts and other maintenance or support items will be available when needed. Both types create a stockpile of such items in the hands of the purchaser, who then has the responsibility of storing and maintaining the stockpile.

Another type is the contract for services that stipulates that the vendor must maintain specified numbers or quantities of certain items that might be needed to maintain or support the service provided, during a specified period of time. This type of procurement has the effect of requiring the vendor (or service provider) to maintain inventory levels of the specified items that might exceed the levels that would be maintained in the absence of such contract requirements.

8.3.4 Mobilization Implications of Minimum-Inventory Techniques in Industry

Modern telecommunications manufacturing systems employ inventory minimization techniques with greatly increased efficiency. This maximizes the output capacity of manufacturers. Thus, on balance, these approaches have increased the Industry's ability to meet surge requirements during mobilization and are essential to maintaining the competitiveness of the Nation's industrial base. However, such fine-tuned production systems may be more vulnerable to disruptions in the supply of components than would have been the case in prior national emergencies. In view of the Group's findings in its report on Dependence on Foreign Sources, this situation causes concern.

The most appropriate remedy for this problem is contractual assurance of the availability of critical components and spare parts by Industry and Government telecommunications users, as opposed to the imposition by the Government of uneconomic inventory requirements on telecommunications manufacturers.

8.3.5 Analytical Framework for Developing Conclusions

In the process of formulating its conclusions, the Joint TIM Group addressed the subject of stockpiles and inventories from two perspectives:

- As a potential solution to industrial mobilization problems such as shortfalls or unavailability of critical telecommunications equipment, materials, and components caused by a cut-off of foreign supplies or a dramatic increase in demand, and

- As a potential problem for industrial mobilization response, reflecting the divergence between probable mobilization needs and the current Industry practice of maintaining only minimal stockpiles and inventories.

The Group recognized in its analysis that technological advances, trends toward increasing consumption, and the changing patterns of domestic production versus imports all suggest that there is no one set of critical items that can be stockpiled or domestically-produced to protect against shortages during mobilization. Today's critical item may be obsolete in a few months, while important segments of today's domestic production capabilities may be shifted offshore next year. As noted in the conclusions of this Group's earlier report on Dependence on Foreign Sources, no process or mechanism currently exists for monitoring technological developments and production/consumption/importation trends, and for interpreting these trends toward the goal of ensuring that NSEP needs can be met in the event of a mobilization or other national emergency.

Within this analytical framework, the Group examined the information it had acquired in the light of the issues identified, and reached the conclusions presented in Section 8.4. These conclusions relate to the Telecommunications Industry as a whole and its relation to Government. They are not intended to apply to specific Government contracts.

8.4 Conclusions

In addressing the concerns expressed by the original TIM Task Force on the subject of Stockpiles and Inventories,[8] the Joint TIM Group has reached the following conclusions on the basis of briefings received, reports reviewed, and discussions with representatives of Government and Industry:

- o No dedicated NSEP stockpiles of telecommunications materials, components, or equipment available to Industry currently exist within either Government or Industry.

- o Rapid advances in technology result in rapid obsolescence of end items. The task of minimizing obsolescence in NSEP stockpiles of telecommunications components, equipment, and possibly materials would be formidable to say the least.

- o The specification and maintenance of such stockpiles, whether by Government or Industry, would be costly and complex.

- o To the extent that minimum-inventory techniques represent Industry practice, severe dislocations in supply channels during mobilization could adversely impact the ability of

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[8] Final Report of the TIM Task Force, Volume I, page 10.

Telecommunications Industry manufacturers to deliver goods and products.

- The imposition of requirements on Industry to maintain stockpiles or surplus inventories for NSEP purposes could adversely affect U.S. Industry's competitive position in the world market for telecommunications equipment or services.

- No mechanism is currently available whereby the Government could compensate Industry as a whole for the costs (including penalties to competitive position) of meeting a Government-imposed general requirement to maintain special-purpose stockpiles or surplus inventories.

- Contracting mechanisms are currently available and in use whereby telecommunications service providers or equipment suppliers are required to maintain (during defined contract periods) specified inventory levels of certain components, materials, equipment items, spare parts, backup systems, etc., for use in peacetime emergencies and other stress conditions.

- No compelling need for NSEP stockpiles of surplus inventories to serve the Telecommunications Industry as a whole has been found during this study.

- No further action or study of this subject by this Group is needed at this time.

8.5 Recommendation

Although no compelling need for NSEP stockpiles has been found in this study, the contracting mechanisms that are currently available and in use for requiring specified inventory levels of certain critical items should be considered in telecommunications mobilization policy and planning.

APPENDIX 8-A
MAINTENANCE OF STOCKPILES AND INVENTORIES BIBLIOGRAPHY

TELECOMMUNICATIONS INDUSTRY MOBILIZATION (TIM):
STOCKPILES AND INVENTORIES

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(PARTIALLY ANNOTATED)

Bement, Arden L. Jr. "Materials Sector Profile," in Technological Frontiers and Foreign Relations. Washington, D.C.: National Academy Press, 1985. pp. 110-164.

The 54-page article surveys advances in materials technology (e.g., synthetic polymers, rubbers, plastics, modified bio-organic substances), forecasts their future applications, and assesses the impact of these developments on U.S. foreign relations and on the Federal Government's management of the strategic materials stockpile. Technological expertise for producing these materials resides in the West (i.e., U.S., Great Britain, France, and West Germany) and Japan, and nations are investing heavily in their high-technology materials development programs. This will lead to greater interdependence and fiercer competition in the marketplace. The author, Vice President for Technical Resources, says that for the U.S. to be a viable competitor in the materials marketplace and to avoid being overly dependent on offshore sources of these materials, the nation's foreign and domestic economic policy must be adjusted. Moreover, if the nation's stockpile is to be maintained without obsolete strategic materials, stockpile management must be more effective. The author provides numerous conclusions, e.g., because "industry is the major ultimate supplier and user of strategic materials and will control the rate of introduction of substitutes for strategic materials," it should have "sustained . . . policy advisory and review roles" in the critical materials sector.

Carrington, Tim. "Military's Dependence on Foreign Suppliers Causes Rising Concern." The Wall Street Journal. March 24, 1988.

Chaudhari, Praveen. "Electronic and Magnetic Materials." Scientific American, October 1986.

The author discusses materials technologies that are most essential to the operation of semiconductor devices. Workers are experimenting with novel combinations of materials and new transistor designs. Two kinds of transistors are now common in the electronics industry - bipolar transistors and the field effect transistor.

"Communications Products (Imports) for Period Ending 12/86." Electronics Foreign Trade. EIA Marketing Services Department. December 1986.

Costello, Robert B. Testimony before the Subcommittee on Economic Stabilization, House Committee on Banking, July 8, 1987. "DOD Strategy for Bolstering Industrial Competitiveness." Defense Issues, Vol. 2, No. 40. pp. 1-3.

Congressional Record-House. "Sec. 229. Department of Defense High-Temperature Superconductivity Research and Development Program." October 13, 1987, H8355.

Congressional Record-Senate. " Title II - Defense Stockpile, Sec. 3201. Revisions of Stockpile Goals." October 6, 1987, S-13637.

Davis, Bob and Eduardo Lachica. "Possibility of Curbs on Foreigners' Sales of Phone Switches in U.S. Raised by FCC." The Wall Street Journal. February 26, 1988.

The Defense Production Action of 1950, as amended. 64 Stat. 798, 50 U.S.C. App. 2061. et seq. August 20, 1980. Executive Order 12626, National Defense Stockpile Manager, February 25, 1988.

Federal Emergency Management Agency. Resource Management: An Historical Perspective. 31 December 1984.

This report summarizes the principal lessons of past mobilizations and identifies critical issues for resource management and organizational planning for future conflicts. The report stresses the importance of flexibility and capability to meet a variety of potential requirements. In a major mobilization, existing defense capacity is considerably less important than the ability to harness new capacity efficiently, in the form of expansion and conversion. Mechanisms are needed not only to control resources, but also to pay for facility expansion and conversion. The report concludes that the specific organizational configuration created to manage industrial mobilization is only of secondary importance, but there must be a single central focus to orchestrate production, to control flow of resources and to resolve conflicts. Principal attention must be given to what can be done within framework of existing legislation. Mobilization plans must be written with enough flexibility to permit different presidential or legislative branch approaches. They must accommodate a wide range of possible requirements and be designed to be implemented by any of a variety of organizations.

Federal Emergency Management Agency. Stockpile Report to the Congress, FEMA 36. October 1983-March 1984.

This report, submitted in accordance with Section 11 of the Strategic and Critical Materials stockpiling Act, provides information on foreign and domestic purchases of materials from October 1983 to March 1984. It also includes information regarding the acquisition and disposal of materials by barter. During this six month period, contracts totalling $39.6 million were awarded for the purchase of iridium, tantalum, and titanium. Disposals of 15 excess stockpile materials totalling $30 million were accomplished through sales contracts. A barter agreement was negotiated with the Government of Jamaica for the acquisition of 1,000,000 long dry tons of bauxite for the National Defense Stockpile. The report also contains information on the financial status of the National Defense Stockpile Transaction Fund and details regarding the administration of the Stockpile program.

Federal Emergency Management Agency. Stockpile Report to the Congress, FEMA 36, April-September 1986.

This Stockpile Report covers operations of the National Defense Stockpile from April 1986 through September 1986. There were no acquisitions of stockpile materials funded from the National Defense Stockpile Transaction Fund during this period. Jewel bearings valued at $502,000 were acquired under separate appropriation. Under the ferroalloy upgrading program, a total of 22,844 short tons of ferromanganese were received back into inventory. Silver valued at $13.3 million was transferred from the Stockpile inventory to the Department of the Treasury for coinage. There were no new barter agreements during this reporting period.

Federal Emergency Management Agency. Stockpile Report to the Congress, FEMA 36. Washington, D.C., October 1986-March 1987.

This report covers stockpile program activities under the Stockpiling Act occurring during the period from October 1, 1986 through March 31, 1987. There were no acquisitions of stockpile materials funded from the National Defense Stockpile Transaction Fund during the report period. However, in December 1986, the GSA circulated a Basic Ordering Agreement to prospective offeror of germanium metal to elicit interest from suppliers in providing that material to the National Defense Stockpile. Jewel bearings valued at $1.1 million were ordered for the Stockpile under separate appropriation. Under the ferroalloy upgrading program, a total of 20,664 short tons of ferrochromium and 22,175 short tons of ferro-manganese were received back into inventory as upgraded material during the report period. Quantities of eight excess stockpile materials with a total value of $24.1 million were transferred out of the Stockpile

during the report period in payment for services under the ferroalloy upgrading program. Silver valued at $36 million was transferred from the Stockpile inventory to the Department of the Treasury for coinage. There were no new barter agreements negotiated during this reporting period.

General Accounting Office. DOD Inventory Management: Revised Policies Needed. GAO/NSIAD-88-75, January 1988.

General Accounting Office. National Defense Stockpile: Adequacy of National Security Council Study for Setting Stockpile Goals. GAO/NSIAD-86-177BR, August 1986.

This is a briefing report to congressional requestors that assesses whether the NSC stockpile study is a sufficient basis for U. S. mobilization planning, including the proposed changes in national defense stockpile goals. The consensus of the report is that the study does not appear to provide sufficient basis for setting stockpile goals or for other U.S. mobilization planning.

General Accounting Office. National Defense Stockpile: National Security Council Study Inadequate to Set Stockpile Goals. GAO/NSIAD-87-146, May 1987.

General Accounting Office. National Stockpile: Could Recycling DOD Aluminum Be Used to Meet the Current Aluminum Need? GAO/RCED-86-23, November 4, 1985.

General Accounting Office. Report to the Honorable Sam Nunn: Overview of the Status of the Defense Industrial Base and DOD's Industrial Preparedness Planning. GAO/NSIAD-85-69, May 23, 1985.

Gladwell, Malcolm. "The Big Blue Computer Firm Overlooked in the Trade War." Insight. April 27, 1987, pp. 42-43.

Lappen, Alyssa A. "Messenger of the Gods." Forbes. March 21, 1988, pp. 150-151.

GE's electronic messenger services has subscribers from 70 countries which earned them about $400 million last year. Some of the markets in which GE participates have quadrupled in one year's time. GE's intelligent computer network understands about 100 computer languages and protocols,

which makes it desirable in a world of various types of desktop computers even within one company. The sportswear retailer, Benetton, uses GE to hook 90 percent of its manufacturers and order agents into an order entry system so that Benetton receives orders within hours instead of days. Other retailers use it to cut their stock of inventory, an area with a potential savings to retailers of $8 billion a year. A 2000-member cooperative stock clearinghouse transmits instructions for most of its members' $3 trillion in annual bond trades through the GE network. GE is proud of its "up time," keeping the network available to customers 99.85 percent of the time. With 500 small computer centers, traffic is automatically rerouted when one goes down. Not only is it cheaper than telephone or facsimile, the network is faster and more efficient, according to GE Information Services' president Tony Craig.

Mackenzie, C. Malcolm. MPAC-Materials and Parts Availability Control Program, a briefing to the Defense Priorities and Allocations System (DPAS) Symposium. 6-7 October 1986.

Mikesell, Raymond F. Stockpiling Strategic Materials: An Evaluation of the National Program. Washington, D.C.: American Enterprise Institute for Public Policy Research, 1986.

Morgan, Dr. John D. "The Defense Production Act." Prepared for the Fifth Annual Mobilization Conference Industrial College of the Armed Forces. Washington, D.C.: U.S. Bureau of Mines, May 22-23, 1986.

This paper describes the Defense Production Act, reviewing the purpose, principal provisions, and application of the Act since its original passage in 1950.

Morgan, Dr. John D. "Management of Mineral Materials in Defense Emergencies." Washington, D.C.: U.S. Bureau of Mines, October 10, 1985.

This paper discusses the Department of Interior's responsibilities for emergency readiness plans and programs for all nonfuel mineral materials. Interior is responsible for mines, concentrating plants, and refineries and for the materials treated in such facilities. DOI has chartered the Emergency Mineral Administration (EMA), through the Bureau of Mines, to carry out operations in the event of a major emergency. It discusses the actions that BOM would take in event of an emergency. These actions would include monitoring exports, export controls, priorities and allocations, and stockpile releases. A long-lasting supply description would call for supply expansion programs under Title III of the Defense Production Act.

Morgan, John D. "Past is Prologue: Strategic Materials and the Defense Industrial Base," Defense Management Journal, First Quarter. Washington, D.C.: GPO, 1982, pp. 15-19.

This report discusses the inadequacies in the defense industrial base especially in strategic materials needed to meet military, industrial, and essential civilian needs of the nation in a national defense emergency. The U.S. is dependent upon distant and unreliable sources for more than half its supplies, while the Soviet Union is largely source self-sufficient. Even a slight increase in current defense procurements would significantly affect a limited group of special property materials. Stockpiling goals for these items are not being met. The report cites examples of the expansion of basic materials producing industries under Title III of the Defense Production Act, which provides wide-ranging authority to increase supplies. In addition to granting the very broad authority of the Defense Production Act, Congress enacted other important measures to stimulate expansion of the defense mobilization base. For example, it reinstated the rapid depreciation provision of the Internal Revenue Code which provided a powerful incentive for defense industries because it granted a 5-year depreciation on facilities certified as necessary to national defense. Overall, the important difference between a wartime economy and a peacetime economy is the degree to which the industrial base can respond to unanticipated wartime demands. Both depend upon an industrial base that reflects planning and established priorities and cannot function without ready supplies of virtually every known raw material.

Murphy, Gerald F. and Raymond E. Brown. Silicon (a Chapter from Mineral Facts and Problems, 1985 Edition), U.S. Bureau of Mines.

This publication provides information on silicon and the silicon industry. Silicon supply and production are related primarily to the requirements of the iron and steel, aluminum and chemical industries and its price is influenced by the cost and availability of transportation and energy. No particular problems are foreseen in supply-demand or from substitution. However, imports of silicon materials continue to take a larger share of the domestic market. This trend, coupled with a smaller demand for silicon owing to a shrinking domestic steel industry, could have a deleterious impact on the viability of the domestic silicon industry.

Nocita, John. "The Civil-Military Interface in Industrial Preparedness," Defense Management Journal, First Quarter. Washington, D.C.: GPO, 1982, pp. 26-33.

The author reviews the mobilization process as it is presently structured, first providing an historical perspective on the development of that process and then discussing the civil-military interface, the role of key agencies, and recent actions to improve the nation's industrial base preparedness. The author concludes that, with sufficient funding, an effective mobilization preparedness program is possible.

North American Telecommunications Association (NATA) Report. "U.S. Balance of Trade in Telephones and Telephone Switching Equipment."

Office of the Assistant Secretary of Defense for Acquisition and Logistics. An Industrial Mobilization Handbook for Government. Washington, D.C., August 1985.

Perle, Richard N. Statement of the Honorable Richard N. Perle, Assistant Secretary of Defense for International Security Policy, Before the House Committee on Science, Space and Technology. April 23, 1987.

Reich, Robert B. "The Rise of Techno-Nationalism." The Atlantic Monthly. May 1987, pp. 63-69.

Richards, Bill. "Fire in Fiber-Optic Gateway Sparks Flight Delays, Problems at Brokerages." The Wall Street Journal. May 11, 1988.

Rutkowski, A. M. "The Exchange Carriers Standards Association." Telecommunications. January 1987, pp. 77-87.

Smith, Esther. "U.S. Overdependent on Japanese Semiconductors." Washington Technology. March 19, 1987, Vol. 1, No. 26.

U.S. Bureau of Mines. Mineral Commodity Summaries 1987. Washington, D.C., 1987.

This report is the earliest Government publication to furnish estimates covering 1986 nonfuel mineral industry data. Most of the estimates are

based on 9 months data. The data sheets contain information on the domestic industry structure, Government programs, tariffs, and 5-year salient statistics for 88 individual minerals and metals.

U.S. Bureau of Mines. "Strategic Materials for Electronic Applications." Prepared for the Joint Industry-Government Telecommunications Industry Mobilization Group. December 12, 1986.

U.S. Department of Commerce (Office of Industrial Resource Administration, International Trade Administration). The Defense Priorities and Allocations System. Washington, D.C.: DOC, 1984.

U.S. House of Representatives. The Ailing Defense Industrial Base: Unready for Crisis. Report of the Defense Industrial Base Panel of the Committee on Armed Services, Ninety-Sixth Congress, Second Session. Washington, D.C.: GPO, 1980.

This report is based on 13 days of hearings from 34 witnesses. The panel found that there was a serious decline in the nation's defense industrial capability. Crucial industrial elements had eroded, while dependence on foreign sources for critical materials grew. It also found that DOD had no ongoing adequate plan to address the defense industrial base preparedness issue; that present procurement policies and procedures by DOD are inflexible; and that current tax and profit policies discourage capital investments in new technology that would increase production. Responsibility for the condition of the base is dispersed among the congressional committees and within the executive branch. This diffusion of responsibility has contributed to a lack of effective long-range planning for industrial responsiveness. The panel makes many recommendations, legislative and non-legislative, to improve industrial base preparedness, including that the President establish within the Executive Office of the President a point of authority to initiate action and to direct and coordinate the efforts of the several responsible departments and agencies.

U. S. House of Representatives, Committee on Armed Services. Synopsis of the Subcommittee on Sea Power and Strategic and Critical Materials Hearing. Hearing on House Resolution 1392. March 17, 1987.